Semester – II

18MBAP205 FINANCIAL MANAGEMENT 5H - 4C

Instruction Hours / week: L: 4 T: 1 P : 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3 Hours

COURSE OBJECTIVES:

To make the students

1. To understand the financial management concept and its importance and its applications in business, their relationship with the business environment and the role and functions of chief financial officer.
2. To know the concept of time value of money and the rationale for using the time value of money concept in capital budgeting techniques for evaluations of business proposals.
3. To recognize the availability of difference source of capital and computation of cost of capital.
4. To recognize the importance of financial leverage, dividend policies and capital structure theories and its application in business.
5. To comprehend on the importance working capital, its determination and application.

COURSE OUTCOMES:

Learners should be able to

1. Understand the role of a financial manager, and their role in taking decisions professionally.
2. Demonstrate knowledge and compute value of money over time and apply the concept to Evaluate the business proposal applying capital budgeting techniques
3. Compute the cost of capital and financial leverage to estimate the optimal capital structure.
4. Comprehend the knowledge of assessing the working of organization to assess the liquidity position of the firm.
5. Demonstrate capabilities of teamwork, problem-solving, critical thinking, and communication skills related to finance decisions.

UNIT I Financial Management, Role of finance manager and sources of finance

Financial Management: Meaning, nature and scope of finance goal – profit vs. wealth maximization; Finance decisions – investment, financing and dividend decisions. Role of finance manager – Treasurer Vs. Controller. Agency conflict and agency cost. Indian financial System - Long Term Sources of Finance: Equity, Debentures, Preference Shares, Long term loan, Private equity, Venture capital and Angel investor. Short term Sources of Finance : Short term loan, commercial paper, certificate of deposits, commercial paper, bill of exchange, factoring.

UNIT II Time value of money and its applications.

Time value of money: Present value, future value, Annuity, Annuity Due, Perpetuity, Amortization schedule, Principles of capital budgeting – method of investment analysis – payback, APR, NPV, IRR discounted cash flow – risk and return decision – profitability index

UNIT III Capital structure and cost of capital

Capital Structure: forms – importance – optimal capital structure – theories – Factors determining capital structure – changes in capital structure – capital gearing. Cost of Capital: Cost of capital – meaning – significance – classification of cost – determination – problems – computation of cost of specific sources of finance (cost of Debt, Equity& Preference shares , Retained earnings) – Computation of weighted average cost of capital, Marginal cost of capital.

UNIT IV Leverage and Dividend policy

Leverages: Meaning – Types – Financial Leverage – Operational Leverage – Composite – Working Capital Leverage. Dividend: Approaches – determinants – types of dividend policy – effects and objects of bonus issue – Dividend theories and Models - Walter's Model, Gordon's Model and MM approach

UNIT V Working capital Management

Working capital requirements: Meaning - concept – kinds – importance of adequate working capital - determinants of working capital - working capital policy- estimation of working capital – operating cycle/ cash conversion cycle. Cash management: optimal cash, cash budget. Inventory management: EOQ, Reorder level Receivables Management: Credit policy, receivables matrix.

Note: Mark distribution - Problems 40 marks and Theory 60 marks.

SUGGESTED READINGS:

1. Pandey. I.M. (2016). *Financial Management,* 11th edition, Vikas Publishing House, New Delhi.
2. Vanhorne, J. C and Wachowicz, J .M Jr . (2015). *Fundamentals of Financial Management*. 13th edition. Pearson Education, New Delhi.
3. Lawrence J. Gitman , Chad J. Zutter, (2017). *Principles of Managerial Finance*. (13th edition). Pearson Education, New Delhi.
4. Khan, M.K. and Jain, P.K.(2017). *Financial Management*, 7th edition, McGraw Hill, New Delhi
5. Chandra, P. (2017). *Financial Management Theory and Practice,* 9th edition, McGraw Hill, New Delhi:

KARPAGAM ACADEMY OF HIGHER EDUCATION

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(Established under section 3 of UGC Act 1956)
Coimbatore-641021

Department of Management

Name: **DR. S S SHANTHAKUMARI & MR. M RAM KUMAR**
Department: **Management**
Subject Code: **18MBAP205** Semester: **II** Year: **2018-20 Batch**
Subject: **FINANCIAL MANAGEMENT**

UNIT 1			
S.No	**Lecture Hours**	**Contents**	**References**
1	1	Financial Management: Meaning Nature and Scope of Financial goal	T2:Pg.No: 3, 4, 5
2	1	Profit Vs Wealth Maximization, Financial decision – Investment Decision and dividend decision	T2: Pg.No:5, 6, 9, 10,
3	1	Role if Financial Manger –Treasurer Vs controller	T2: Pg.No: 8
4	1	Agency conflict and Agency cost	T2: Pg.No
5	1	Tutorial – Infosys and kingfisher	
6	1	Financial System	T2: Pg.No: 25-39
7	1	Long term sources of finance – equity and debenture and asset based financing	T2: Pg.No: 26
8	1	Preference shares, private Equity venture capital and Angel investor	T2.Pg.No:31, 32 to
9	1	Short term finance – commercial paper, certificate of deposit, Bill of exchange, factoring	T2:Pg.No:38
10	1	Recap and discussion of important topics and question	
Total Number of hours planned for Unit 1			**10**
UNIT 2			
1	1	Time value of Money – its importance in business and	W8

		Personal life	
2	1	Present value, future value, Annuity, Annuity due, Perpetuity, Amortization schedule	W8
3	1	Tutorial: Present value, Future Value, Annuity, Annuity Due	W8
4	1	Tutorial: Perpetuity, Amortization schedule	W8
5	1	Capital Budgeting: Principles types of capital budgeting	T2: Pg.No: 119 to 147
6	1	Methods of investment Analysis: Discounted and Non-Discounted cash flow methods	T2: Pg.No : 122
7	1	NPV, Profitability Index (PI)	T2: Pg.No 122 to 124
8	1	Tutorial : NPV, PI	T2: Pg.No 122 to 124
9	1	Pay Back Period, IRR, ARR	Pg.No : 131, 135
10	1	Tutorial – IRR, (Equal and Unequal)	Pg.No : 131, 135
11	1	Tutorial – Payback Period, ARR	Pg.No : 131, 135
12	1	Risk and Return Decision	T2: Pg.No 136
13	1	Types of risk: Systematic and Unsystematic Risk	T2: Pg.No 142 to 144
14	1	Recap of the Unit and Discussion	
Total Number of hours planned for Unit 2			**19**
UNIT 3			
1	1	Capital structure : Forms, importance optical capital structure ,Factors determining capital structure	T2: Pg.No: 47 to 64
2	1	Change in capital structure-capital gearing-components cost of capital	T2: Pg.No 49
3	1	Capital structure theories-NI,NOI approvals	T2:Pg.No 53,57

4	1	Capital structure theories- Traditional, Arbitrage impact	T2: Pg.No: 51
5	1	Cost of capital significance classification of cost-determination	T2: Pg.No 65
6	1	Tutorial – Capital structure theories NI/NOI → Problem	T2:Pg.No 53
7	1	Cost of debit ,Cost of preference cost of equity –constant growth mode and CAPM model ,WACC, Marginal cost of capital	T2:Pg.No: 72
8	1	Tutorial – cost of debit, cost of preference share, cost of equity Preference share, cost of equity	T2:Pg.No: 72
9	1	Importance of WACC vs Marginal cost of capital	T2: Pg.No: 72
10	1	Tutorial –WACC calculation book value vs Market value	T2: Pg.No: 77
11	1	Recap of the unit and discussions	
Total Number of hours planned for Unit 3			**11**
UNIT 4			
1	1	Leverages : Meaning – Types Operating leverage, financial leverage , composite / Total leverage – working (wc) capital leverages	T2:Pg.No 83 to 98
2	1	Tutorial: Operating leverages	T2:Pg.No 84
3	1	Tutorial: Financial leverages	T2:Pg.No 86
4	1	Tutorial: Total/composite ,WC leverage	T2:Pg.No 90
5	1	Tutorial: EBIT – EPS analysis	T2:Pg.No 89
6	1	Dividend : Approaches ,Determinants Types of dividend policy	T2:Pg.No 99 to 108
7	1	Effects of bonus Issue	T2:Pg.No 100
8	1	Dividend theories – Bird in Hard theory	T2:Pg.No 101 to 107

9	1	Walter model ,Gordon model	T2:Pg.No 107
10	1	MM approach	T2:Pg.No 100
11	1	Recap of the Unit and Discussion	
Total Number of hours planned for Unit 4			**11**
UNIT 5			
1	1	Working capital (WC) meaning ,concepts, kind of Working capital, Importance of Adequate Working capital , Determinants of Working capital and Working capital Policy	T2:Pg.No 149 to 163
2	1	Tutorial: Estimation of Working Capital	T2:Pg.No 169
3	1	Tutorial: Cash conversion cycle / Operating Cycle	T2:Pg.No 173
4	1	Cash Management –Cash Budget	T2:Pg.No 173
5	1	Inventory Management – ABC / VED Analysis , WOQ, Reorder Level, Receivable Management, Credit Policy and receivables metrics	T2:Pg.No 171 to 172
6	1	ESE Question Paper Recap	
7	1	ESE Question Paper Recap	
8	1	ESE Question Paper Recap	
9	1	Recap and discussion of the unit content	
Total Number of hours planned for Unit 5 and discussion of previous year ESE Question papers			**9**
Total Number of hours allotted for all five units			**96**

SUGGESTED READINGS:

1. TB 1. Pandey I M Financial Management Vikas Publishing, House, 11th Edition 2016
2. TB 2. E. PAramasiva., T.Subramanian Financial Management, New Age International Publisher
3. TB 3 Lawrence J. Gitman, Chad J. Zutter, Principles of Managerial Finance Pearson Education 13th edition 2017
4. TB 4 Khan and Jain Financial Management Tata McGraw Hill, 7th edition 2017

5. TB 5 Chandra, P. Financial Management Theory and Practice Tata McGraw Hill, 9th edition 2017

Websites:

1. W1: https://www.rbi.org.in/
2. W2. https://www.sebi.gov.in/
3. W3. www.nseindia.com
4. W4. www.bseindia.com
5. W5. www.primedatabase.com
6. W6. https://in.reuters.com/
7. W7. https://economictimes.indiatimes.com/
8. W8: https://www.scranton.edu/faculty/hussain/teaching/mba503c/MBA503C02.pdf

Chapter 1

Introduction to Financial Management

INTRODUCTION

Business concern needs finance to meet their requirements in the economic world. Any kind of business activity depends on the finance. Hence, it is called as lifeblood of business organization. Whether the business concerns are big or small, they need finance to fulfil their business activities.

In the modern world, all the activities are concerned with the economic activities and very particular to earning profit through any venture or activities. The entire business activities are directly related with making profit. (According to the economics concept of factors of production, rent given to landlord, wage given to labour, interest given to capital and profit given to shareholders or proprietors), a business concern needs finance to meet all the requirements. Hence finance may be called as capital, investment, fund etc., but each term is having different meanings and unique characters. Increasing the profit is the main aim of any kind of economic activity.

MEANING OF FINANCE

Finance may be defined as the art and science of managing money. It includes financial service and financial instruments. Finance also is referred as the provision of money at the time when it is needed. Finance function is the procurement of funds and their effective utilization in business concerns.

The concept of finance includes capital, funds, money, and amount. But each word is having unique meaning. Studying and understanding the concept of finance become an important part of the business concern.

DEFINITION OF FINANCE

According to **Khan and Jain,** "Finance is the art and science of managing money".

According to **Oxford dictionary**, the word 'finance' connotes 'management of money'.

Webster's Ninth New Collegiate Dictionary defines finance as "the Science on study of the management of funds' and the management of fund as the system that includes the circulation of money, the granting of credit, the making of investments, and the provision of banking facilities.

DEFINITION OF BUSINESS FINANCE

According to the **Wheeler,** "Business finance is that business activity which concerns with the acquisition and conversation of capital funds in meeting financial needs and overall objectives of a business enterprise".

According to the **Guthumann and Dougall**, "Business finance can broadly be defined as the activity concerned with planning, raising, controlling, administering of the funds used in the business".

In the words of **Parhter and Wert**, "Business finance deals primarily with raising, administering and disbursing funds by privately owned business units operating in non-financial fields of industry".

Corporate finance is concerned with budgeting, financial forecasting, cash management, credit administration, investment analysis and fund procurement of the business concern and the business concern needs to adopt modern technology and application suitable to the global environment.

According to the **Encyclopedia of Social Sciences**, "Corporation finance deals with the financial problems of corporate enterprises. These problems include the financial aspects of the promotion of new enterprises and their administration during early development, the accounting problems connected with the distinction between capital and income, the administrative questions created by growth and expansion, and finally, the financial adjustments required for the bolstering up or rehabilitation of a corporation which has come into financial difficulties".

TYPES OF FINANCE

Finance is one of the important and integral part of business concerns, hence, it plays a major role in every part of the business activities. It is used in all the area of the activities under the different names.

Finance can be classified into two major parts:

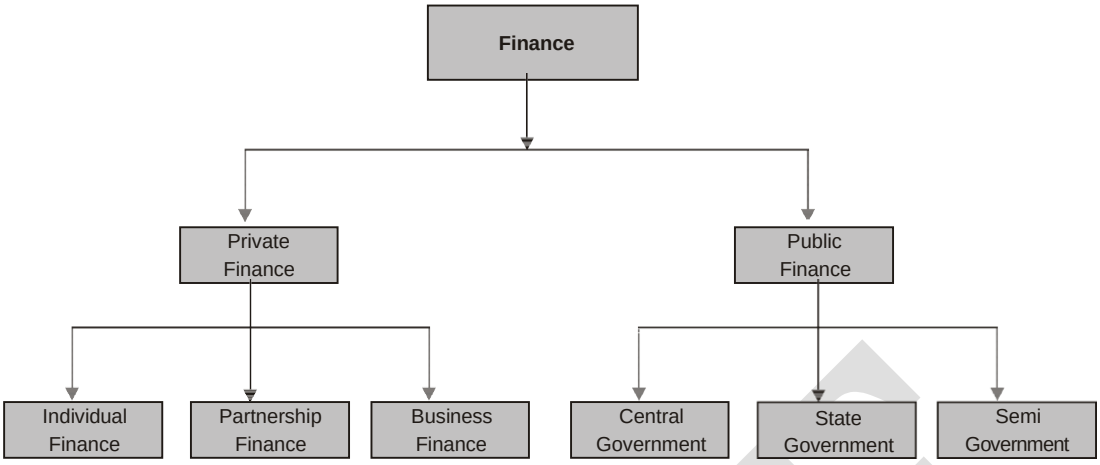


Fig. 1.1 *Types of Finance*

Private Finance, which includes the Individual, Firms, Business or Corporate Financial activities to meet the requirements.

Public Finance which concerns with revenue and disbursement of Government such as Central Government, State Government and Semi-Government Financial matters.

DEFINITION OF FINANCIAL MANAGEMENT

Financial management is an integral part of overall management. It is concerned with the duties of the financial managers in the business firm.

The term financial management has been defined by **Solomon**, "It is concerned with the efficient use of an important economic resource namely, capital funds".

The most popular and acceptable definition of financial management as given by **S.C. Kuchal** is that "Financial Management deals with procurement of funds and their effective utilization in the business".

Howard and Upton : Financial management "as an application of general managerial principles to the area of financial decision-making.

Weston and Brigham : Financial management "is an area of financial decision-making, harmonizing individual motives and enterprise goals".

Joshep and Massie : Financial management "is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations.

Thus, Financial Management is mainly concerned with the effective funds management in the business. In simple words, Financial Management as practiced by business firms can be called as Corporation Finance or Business Finance.

SCOPE OF FINANCIAL MANAGEMENT

Financial management is one of the important parts of overall management, which is directly related with various functional departments like personnel, marketing and production. Financial management covers wide area with multidimensional approaches. The following are the important scope of financial management.

1. **Financial Management and Economics**

   Economic concepts like micro and macroeconomics are directly applied with the financial management approaches. Investment decisions, micro and macro environmental factors are closely associated with the functions of financial manager. Financial management also uses the economic equations like money value discount factor, economic order quantity etc. Financial economics is one of the emerging area, which provides immense opportunities to finance, and economical areas.

2. **Financial Management and Accounting**

   Accounting records includes the financial information of the business concern. Hence, we can easily understand the relationship between the financial management and accounting. In the olden periods, both financial management and accounting are treated as a same discipline and then it has been merged as Management Accounting because this part is very much helpful to finance manager to take decisions. But nowaday's financial management and accounting discipline are separate and interrelated.

3. **Financial Management or Mathematics**

   Modern approaches of the financial management applied large number of mathematical and statistical tools and techniques. They are also called as econometrics. Economic order quantity, discount factor, time value of money, present value of money, cost of capital, capital structure theories, dividend theories, ratio analysis and working capital analysis are used as mathematical and statistical tools and techniques in the field of financial management.

4. **Financial Management and Production Management**

   Production management is the operational part of the business concern, which helps to multiple the money into profit. Profit of the concern depends upon the production performance. Production performance needs finance, because production department requires raw material, machinery, wages, operating expenses etc. These expenditures are decided and estimated by the financial department and the finance manager allocates the appropriate finance to production department. The financial manager must be aware of the operational process and finance required for each process of production activities.

5. **Financial Management and Marketing**

   Produced goods are sold in the market with innovative and modern approaches. For this, the marketing department needs finance to meet their requirements.

The financial manager or finance department is responsible to allocate the adequate finance to the marketing department. Hence, marketing and financial management are interrelated and depends on each other.

6. Financial Management and Human Resource

Financial management is also related with human resource department, which provides manpower to all the functional areas of the management. Financial manager should carefully evaluate the requirement of manpower to each department and allocate the finance to the human resource department as wages, salary, remuneration, commission, bonus, pension and other monetary benefits to the human resource department. Hence, financial management is directly related with human resource management.

OBJECTIVES OF FINANCIAL MANAGEMENT

Effective procurement and efficient use of finance lead to proper utilization of the finance by the business concern. It is the essential part of the financial manager. Hence, the financial manager must determine the basic objectives of the financial management. Objectives of Financial Management may be broadly divided into two parts such as:

1. Profit maximization
2. Wealth maximization.

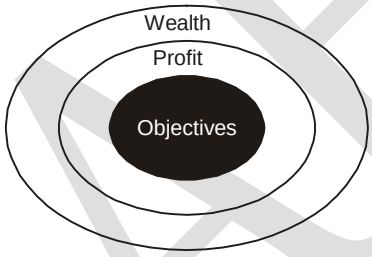


Fig. 1.2 *Objectives of Financial Management*

Profit Maximization

Main aim of any kind of economic activity is earning profit. A business concern is also functioning mainly for the purpose of earning profit. Profit is the measuring techniques to understand the business efficiency of the concern. Profit maximization is also the traditional and narrow approach, which aims at, maximizes the profit of the concern. Profit maximization consists of the following important features.

1. Profit maximization is also called as cashing per share maximization. It leads to maximize the business operation for profit maximization.
2. Ultimate aim of the business concern is earning profit, hence, it considers all the possible ways to increase the profitability of the concern.

3. Profit is the parameter of measuring the efficiency of the business concern. So it shows the entire position of the business concern.
4. Profit maximization objectives help to reduce the risk of the business.

Favourable Arguments for Profit Maximization

The following important points are in support of the profit maximization objectives of the business concern:

(i) Main aim is earning profit.
(ii) Profit is the parameter of the business operation.
(iii) Profit reduces risk of the business concern.
(iv) Profit is the main source of finance.
(v) Profitability meets the social needs also.

Unfavourable Arguments for Profit Maximization

The following important points are against the objectives of profit maximization:

(i) Profit maximization leads to exploiting workers and consumers.
(ii) Profit maximization creates immoral practices such as corrupt practice, unfair trade practice, etc.
(iii) Profit maximization objectives leads to inequalities among the sake holders such as customers, suppliers, public shareholders, etc.

Drawbacks of Profit Maximization

Profit maximization objective consists of certain drawback also:

(i) **It is vague :** In this objective, profit is not defined precisely or correctly. It creates some unnecessary opinion regarding earning habits of the business concern.
(ii) **It ignores the time value of money:** Profit maximization does not consider the time value of money or the net present value of the cash inflow. It leads certain differences between the actual cash inflow and net present cash flow during a particular period.
(iii) **It ignores risk:** Profit maximization does not consider risk of the business concern. Risks may be internal or external which will affect the overall operation of the business concern.

Wealth Maximization

Wealth maximization is one of the modern approaches, which involves latest innovations and improvements in the field of the business concern. The term wealth means shareholder wealth or the wealth of the persons those who are involved in the business concern.

Wealth maximization is also known as value maximization or net present worth maximization. This objective is an universally accepted concept in the field of business.

Favourable Arguments for Wealth Maximization

(i) Wealth maximization is superior to the profit maximization because the main aim of the business concern under this concept is to improve the value or wealth of the shareholders.

(ii) Wealth maximization considers the comparison of the value to cost associated with the business concern. Total value detected from the total cost incurred for the business operation. It provides extract value of the business concern.

(iii) Wealth maximization considers both time and risk of the business concern.

(iv) Wealth maximization provides efficient allocation of resources.

(v) It ensures the economic interest of the society.

Unfavourable Arguments for Wealth Maximization

(i) Wealth maximization leads to prescriptive idea of the business concern but it may not be suitable to present day business activities.

(ii) Wealth maximization is nothing, it is also profit maximization, it is the indirect name of the profit maximization.

(iii) Wealth maximization creates ownership-management controversy.

(iv) Management alone enjoy certain benefits.

(v) The ultimate aim of the wealth maximization objectives is to maximize the profit.

(vi) Wealth maximization can be activated only with the help of the profitable position of the business concern.

APPROACHES TO FINANCIAL MANAGEMENT

Financial management approach measures the scope of the financial management in various fields, which include the essential part of the finance. Financial management is not a revolutionary concept but an evolutionary. The definition and scope of financial management has been changed from one period to another period and applied various innovations. Theoretical points of view, financial management approach may be broadly divided into two major parts.

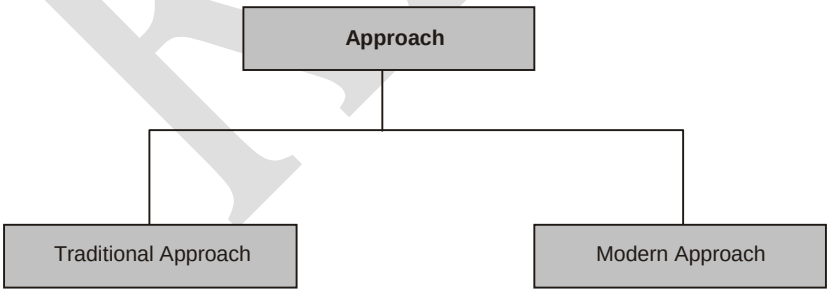


Fig. 1.3 *Approaches to Finance Management*

Traditional Approach

Traditional approach is the initial stage of financial management, which was followed, in the early part of during the year 1920 to 1950. This approach is based on the past experience and the traditionally accepted methods. Main part of the traditional approach is rising of funds for the business concern. Traditional approach consists of the following important area.

Arrangement of funds from lending body.

Arrangement of funds through various financial instruments.

Finding out the various sources of funds.

FUNCTIONS OF FINANCE MANAGER

Finance function is one of the major parts of business organization, which involves the permanent, and continuous process of the business concern. Finance is one of the interrelated functions which deal with personal function, marketing function, production function and research and development activities of the business concern. At present, every business concern concentrates more on the field of finance because, it is a very emerging part which reflects the entire operational and profit ability position of the concern. Deciding the proper financial function is the essential and ultimate goal of the business organization.

Finance manager is one of the important role players in the field of finance function. He must have entire knowledge in the area of accounting, finance, economics and management. His position is highly critical and analytical to solve various problems related to finance. A person who deals finance related activities may be called finance manager.

Finance manager performs the following major functions:

1. **Forecasting Financial Requirements**

   It is the primary function of the Finance Manager. He is responsible to estimate the financial requirement of the business concern. He should estimate, how much finances required to acquire fixed assets and forecast the amount needed to meet the working capital requirements in future.

2. **Acquiring Necessary Capital**

   After deciding the financial requirement, the finance manager should concentrate how the finance is mobilized and where it will be available. It is also highly critical in nature.

3. **Investment Decision**

   The finance manager must carefully select best investment alternatives and consider the reasonable and stable return from the investment. He must be well versed in the field of capital budgeting techniques to determine the effective utilization of investment. The finance manager must concentrate to principles of safety, liquidity and profitability while investing capital.

4. Cash Management

Present days cash management plays a major role in the area of finance because proper cash management is not only essential for effective utilization of cash but it also helps to meet the short-term liquidity position of the concern.

5. Interrelation with Other Departments

Finance manager deals with various functional departments such as marketing, production, personel, system, research, development, etc. Finance manager should have sound knowledge not only in finance related area but also well versed in other areas. He must maintain a good relationship with all the functional departments of the business organization.

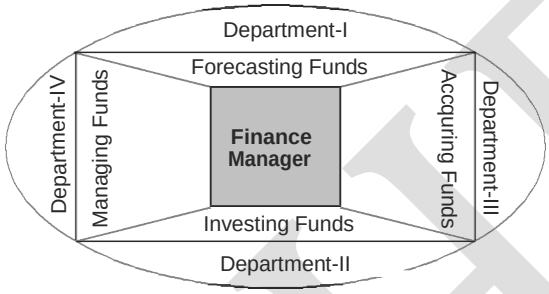


Fig 1.4 *Functions of Financial Manager*

IMPORTANCE OF FINANCIAL MANAGEMENT

Finance is the lifeblood of business organization. It needs to meet the requirement of the business concern. Each and every business concern must maintain adequate amount of finance for their smooth running of the business concern and also maintain the business carefully to achieve the goal of the business concern. The business goal can be achieved only with the help of effective management of finance. We can't neglect the importance of finance at any time at and at any situation. Some of the importance of the financial management is as follows:

Financial Planning

Financial management helps to determine the financial requirement of the business concern and leads to take financial planning of the concern. Financial planning is an important part of the business concern, which helps to promotion of an enterprise.

Acquisition of Funds

Financial management involves the acquisition of required finance to the business concern. Acquiring needed funds play a major part of the financial management, which involve possible source of finance at minimum cost.

Proper Use of Funds

Proper use and allocation of funds leads to improve the operational efficiency of the business concern. When the finance manager uses the funds properly, they can reduce the cost of capital and increase the value of the firm.

Financial Decision

Financial management helps to take sound financial decision in the business concern. Financial decision will affect the entire business operation of the concern. Because there is a direct relationship with various department functions such as marketing, production personnel, etc.

Improve Profitability

Profitability of the concern purely depends on the effectiveness and proper utilization of funds by the business concern. Financial management helps to improve the profitability position of the concern with the help of strong financial control devices such as budgetary control, ratio analysis and cost volume profit analysis.

Increase the Value of the Firm

Financial management is very important in the field of increasing the wealth of the investors and the business concern. Ultimate aim of any business concern will achieve the maximum profit and higher profitability leads to maximize the wealth of the investors as well as the nation.

Promoting Savings

Savings are possible only when the business concern earns higher profitability and maximizing wealth. Effective financial management helps to promoting and mobilizing individual and corporate savings.

Nowadays financial management is also popularly known as business finance or corporate finances. The business concern or corporate sectors cannot function without the importance of the financial management.

MODEL QUESTIONS

1. What is finance? Define business finance.
2. Explain the types of finance.
3. Discuss the objectives of financial management.
4. Critically evaluate various approaches to the financial management.
5. Explain the scope of financial management.
6. Discuss the role of financial manager.
7. Explain the importance of financial management.

Chapter 3 Sources of Financing

INTRODUCTION

Finance is the lifeblood of business concern, because it is interlinked with all activities performed by the business concern. In a human body, if blood circulation is not proper, body function will stop. Similarly, if the finance not being properly arranged, the business system will stop. Arrangement of the required finance to each department of business concern is highly a complex one and it needs careful decision. Quantum of finance may be depending upon the nature and situation of the business concern. But, the requirement of the finance may be broadly classified into two parts:

Long-term Financial Requirements or Fixed Capital Requirement

Financial requirement of the business differs from firm to firm and the nature of the requirements on the basis of terms or period of financial requirement, it may be long term and short-term financial requirements.

Long-term financial requirement means the finance needed to acquire land and building for business concern, purchase of plant and machinery and other fixed expenditure. Long-term financial requirement is also called as fixed capital requirements. Fixed capital is the capital, which is used to purchase the fixed assets of the firms such as land and building, furniture and fittings, plant and machinery, etc. Hence, it is also called a capital expenditure.

Short-term Financial Requirements or Working Capital Requirement

Apart from the capital expenditure of the firms, the firms should need certain expenditure like procurement of raw materials, payment of wages, day-to-day expenditures, etc. This kind of expenditure is to meet with the help of short-term financial requirements which will meet the operational expenditure of the firms. Short-term financial requirements are popularly known as working capital.

SOURCES OF FINANCE

Sources of finance mean the ways for mobilizing various terms of finance to the industrial concern. Sources of finance state that, how the companies are mobilizing finance for their requirements. The companies belong to the existing or the new which need sum amount of finance to meet the long-term and short-term requirements such as purchasing of fixed assets, construction of office building, purchase of raw materials and day-to-day expenses.

Sources of finance may be classified under various categories according to the following important heads:

1. Based on the Period

Sources of Finance may be classified under various categories based on the period.

Long-term sources: Finance may be mobilized by long-term or short-term. When the finance mobilized with large amount and the repayable over the period will be more than five years, it may be considered as long-term sources. Share capital, issue of debenture, long-term loans from financial institutions and commercial banks come under this kind of source of finance. Long-term source of finance needs to meet the capital expenditure of the firms such as purchase of fixed assets, land and buildings, etc.

Long-term sources of finance include:

- Equity Shares
- Preference Shares
- Debenture
- Long-term Loans
- Fixed Deposits

Short-term sources: Apart from the long-term source of finance, firms can generate finance with the help of short-term sources like loans and advances from commercial banks, moneylenders, etc. Short-term source of finance needs to meet the operational expenditure of the business concern.

Short-term source of finance include:

- Bank Credit
- Customer Advances
- Trade Credit
- Factoring
- Public Deposits
- Money Market Instruments

2. Based on Ownership

Sources of Finance may be classified under various categories based on the period:

An ownership source of finance include

- Shares capital, earnings
- Retained earnings
- Surplus and Profits

Borrowed capital include

- Debenture
- Bonds
- Public deposits
- Loans from Bank and Financial Institutions.

3. Based on Sources of Generation

Sources of Finance may be classified into various categories based on the period.

Internal source of finance includes

- Retained earnings
- Depreciation funds
- Surplus

External sources of finance may be include

- Share capital
- Debenture
- Public deposits
- Loans from Banks and Financial institutions

4. Based in Mode of Finance

Security finance may be include

- Shares capital
- Debenture

Retained earnings may include

- Retained earnings
- Depreciation funds

Loan finance may include

- Long-term loans from Financial Institutions
- Short-term loans from Commercial banks.

The above classifications are based on the nature and how the finance is mobilized from various sources. But the above sources of finance can be divided into three major classifications:

- Security Finance
- Internal Finance
- Loans Finance

SECURITY FINANCE

If the finance is mobilized through issue of securities such as shares and debenture, it is called as security finance. It is also called as corporate securities. This type of finance plays a major role in the field of deciding the capital structure of the company.

Characters of Security Finance

Security finance consists of the following important characters:

1. Long-term sources of finance.
2. It is also called as corporate securities.
3. Security finance includes both shares and debentures.
4. It plays a major role in deciding the capital structure of the company.
5. Repayment of finance is very limited.
6. It is a major part of the company's total capitalization.

Types of Security Finance

Security finance may be divided into two major types:

1. Ownership securities or capital stock.
2. Creditorship securities or debt capital.

Ownership Securities

The ownership securities also called as capital stock, is commonly called as shares. Shares are the most Universal method of raising finance for the business concern. Ownership capital consists of the following types of securities.

- Equity Shares
- Preference Shares
- No par stock
- Deferred Shares

EQUITY SHARES

Equity Shares also known as ordinary shares, which means, other than preference shares. Equity shareholders are the real owners of the company. They have a control over the management of the company. Equity shareholders are eligible to get dividend if the company earns profit. Equity share capital cannot be redeemed during the lifetime of the company. The liability of the equity shareholders is the value of unpaid value of shares.

Features of Equity Shares

Equity shares consist of the following important features:

1. **Maturity of the shares:** Equity shares have permanent nature of capital, which has no maturity period. It cannot be redeemed during the lifetime of the company.

2. **Residual claim on income:** Equity shareholders have the right to get income left after paying fixed rate of dividend to preference shareholder. The earnings or the income available to the shareholders is equal to the profit after tax minus preference dividend.
3. **Residual claims on assets:** If the company wound up, the ordinary or equity shareholders have the right to get the claims on assets. These rights are only available to the equity shareholders.
4. **Right to control:** Equity shareholders are the real owners of the company. Hence, they have power to control the management of the company and they have power to take any decision regarding the business operation.
5. **Voting rights:** Equity shareholders have voting rights in the meeting of the company with the help of voting right power; they can change or remove any decision of the business concern. Equity shareholders only have voting rights in the company meeting and also they can nominate proxy to participate and vote in the meeting instead of the shareholder.
6. **Pre-emptive right:** Equity shareholder pre-emptive rights. The pre-emptive right is the legal right of the existing shareholders. It is attested by the company in the first opportunity to purchase additional equity shares in proportion to their current holding capacity.
7. **Limited liability:** Equity shareholders are having only limited liability to the value of shares they have purchased. If the shareholders are having fully paid up shares, they have no liability. For example: If the shareholder purchased 100 shares with the face value of Rs. 10 each. He paid only Rs. 900. His liability is only Rs. 100.

   Total number of shares 100

   Face value of shares Rs. 10

   Total value of shares $100 \times 10 = 1{,}000$

   Paid up value of shares 900

   Unpaid value/liability 100

   Liability of the shareholders is only unpaid value of the share (that is Rs. 100).

Advantages of Equity Shares

Equity shares are the most common and universally used shares to mobilize finance for the company. It consists of the following advantages.

1. **Permanent sources of finance:** Equity share capital is belonging to long-term permanent nature of sources of finance, hence, it can be used for long-term or fixed capital requirement of the business concern.
2. **Voting rights:** Equity shareholders are the real owners of the company who have voting rights. This type of advantage is available only to the equity shareholders.
3. **No fixed dividend:** Equity shares do not create any obligation to pay a fixed rate of dividend. If the company earns profit, equity shareholders are eligible for

profit, they are eligible to get dividend otherwise, and they cannot claim any dividend from the company.

4. **Less cost of capital:** Cost of capital is the major factor, which affects the value of the company. If the company wants to increase the value of the company, they have to use more share capital because, it consists of less cost of capital (K_e) while compared to other sources of finance.
5. **Retained earnings:** When the company have more share capital, it will be suitable for retained earnings which is the less cost sources of finance while compared to other sources of finance.

Disadvantages of Equity Shares

1. **Irredeemable:** Equity shares cannot be redeemed during the lifetime of the business concern. It is the most dangerous thing of over capitalization.
2. **Obstacles in management:** Equity shareholder can put obstacles in management by manipulation and organizing themselves. Because, they have power to contrast any decision which are against the wealth of the shareholders.
3. **Leads to speculation:** Equity shares dealings in share market lead to secularism during prosperous periods.
4. **Limited income to investor:** The Investors who desire to invest in safe securities with a fixed income have no attraction for equity shares.
5. **No trading on equity:**When the company raises capital only with the help of equity, the company cannot take the advantage of trading on equity.

PREFERENCE SHARES

The parts of corporate securities are called as preference shares. It is the shares, which have preferential right to get dividend and get back the initial investment at the time of winding up of the company. Preference shareholders are eligible to get fixed rate of dividend and they do not have voting rights.

Preference shares may be classified into the following major types:

1. **Cumulative preference shares:** Cumulative preference shares have right to claim dividends for those years which have no profits. If the company is unable to earn profit in any one or more years, C.P. Shares are unable to get any dividend but they have right to get the comparative dividend for the previous years if the company earned profit.
2. **Non-cumulative preference shares:** Non-cumulative preference shares have no right to enjoy the above benefits. They are eligible to get only dividend if the company earns profit during the years. Otherwise, they cannot claim any dividend.

3. **Redeemable preference shares:** When, the preference shares have a fixed maturity period it becomes redeemable preference shares. It can be redeemable during the lifetime of the company. The Company Act has provided certain restrictions on the return of the redeemable preference shares.

Irredeemable Preference Shares

Irredeemable preference shares can be redeemed only when the company goes for liquidator. There is no fixed maturity period for such kind of preference shares.

Participating Preference Shares

Participating preference sharesholders have right to participate extra profits after distributing the equity shareholders.

Non-Participating Preference Shares

Non-participating preference sharesholders are not having any right to participate extra profits after distributing to the equity shareholders. Fixed rate of dividend is payable to the type of shareholders.

Convertible Preference Shares

Convertible preference sharesholders have right to convert their holding into equity shares after a specific period. The articles of association must authorize the right of conversion.

Non-convertible Preference Shares

There shares, cannot be converted into equity shares from preference shares.

Features of Preference Shares

The following are the important features of the preference shares:

1. **Maturity period:** Normally preference shares have no fixed maturity period except in the case of redeemable preference shares. Preference shares can be redeemable only at the time of the company liquidation.
2. **Residual claims on income:** Preferential sharesholders have a residual claim on income. Fixed rate of dividend is payable to the preference shareholders.
3. **Residual claims on assets:** The first preference is given to the preference shareholders at the time of liquidation. If any extra Assets are available that should be distributed to equity shareholder.
4. **Control of Management:** Preference shareholder does not have any voting rights. Hence, they cannot have control over the management of the company.

Advantages of Preference Shares

Preference shares have the following important advantages.

1. **Fixed dividend:** The dividend rate is fixed in the case of preference shares. It is called as fixed income security because it provides a constant rate of income to the investors.

2. **Cumulative dividends:** Preference shares have another advantage which is called cumulative dividends. If the company does not earn any profit in any previous years, it can be cumulative with future period dividend.
3. **Redemption:** Preference Shares can be redeemable after a specific period except in the case of irredeemable preference shares. There is a fixed maturity period for repayment of the initial investment.
4. **Participation:** Participative preference sharesholders can participate in the surplus profit after distribution to the equity shareholders.
5. **Convertibility:** Convertibility preference shares can be converted into equity shares when the articles of association provide such conversion.

Disadvantages of Preference Shares

1. **Expensive sources of finance:** Preference shares have high expensive source of finance while compared to equity shares.
2. **No voting right:** Generally preference sharesholders do not have any voting rights. Hence they cannot have the control over the management of the company.
3. **Fixed dividend only:** Preference shares can get only fixed rate of dividend. They may not enjoy more profits of the company.
4. **Permanent burden:** Cumulative preference shares become a permanent burden so far as the payment of dividend is concerned. Because the company must pay the dividend for the unprofitable periods also.
5. **Taxation:** In the taxation point of view, preference shares dividend is not a deductible expense while calculating tax. But, interest is a deductible expense. Hence, it has disadvantage on the tax deduction point of view.

DEFERRED SHARES

Deferred shares also called as founder shares because these shares were normally issued to founders. The shareholders have a preferential right to get dividend before the preference shares and equity shares. According to Companies Act 1956 no public limited company or which is a subsidiary of a public company can issue deferred shares.

These shares were issued to the founder at small denomination to control over the management by the virtue of their voting rights.

NO PAR SHARES

When the shares are having no face value, it is said to be no par shares. The company issues this kind of shares which is divided into a number of specific shares without any specific denomination. The value of shares can be measured by dividing the real net worth of the company with the total number of shares.

$$\text{Value of no. per share} = \frac{\text{The real net worth}}{\text{Total no. of shares}}$$

CREDITORSHIP SECURITIES

Creditorship Securities also known as debt finance which means the finance is mobilized from the creditors. Debenture and Bonds are the two major parts of the Creditorship Securities.

Debentures

A Debenture is a document issued by the company. It is a certificate issued by the company under its seal acknowledging a debt.

According to the Companies Act 1956, "debenture includes debenture stock, bonds and any other securities of a company whether constituting a charge of the assets of the company or not."

Types of Debentures

Debentures may be divided into the following major types:

1. **Unsecured debentures:** Unsecured debentures are not given any security on assets of the company. It is also called simple or naked debentures. This type of debentures are treaded as unsecured creditors at the time of winding up of the company.
2. **Secured debentures:** Secured debentures are given security on assets of the company. It is also called as mortgaged debentures because these debentures are given against any mortgage of the assets of the company.
3. **Redeemable debentures:** These debentures are to be redeemed on the expiry of a certain period. The interest is paid periodically and the initial investment is returned after the fixed maturity period.
4. **Irredeemable debentures:** These kind of debentures cannot be redeemable during the life time of the business concern.
5. **Convertible debentures:** Convertible debentures are the debentures whose holders have the option to get them converted wholly or partly into shares. These debentures are usually converted into equity shares. Conversion of the debentures may be:

   Non-convertible debentures

   Fully convertible debentures

   Partly convertible debentures
6. **Other types:** Debentures can also be classified into the following types. Some of the common types of the debentures are as follows:
   1. Collateral Debenture
   2. Guaranteed Debenture
   3. First Debenture
   4. Zero Coupon Bond
   5. Zero Interest Bond/Debenture

Features of Debentures

1. **Maturity period:** Debentures consist of long-term fixed maturity period. Normally, debentures consist of 10–20 years maturity period and are repayable with the principle investment at the end of the maturity period.
2. **Residual claims in income:** Debenture holders are eligible to get fixed rate of interest at every end of the accounting period. Debenture holders have priority of claim in income of the company over equity and preference shareholders.
3. **Residual claims on asset:** Debenture holders have priority of claims on Assets of the company over equity and preference shareholders. The Debenture holders may have either specific change on the Assets or floating change of the assets of the company. Specific change of Debenture holders are treated as secured creditors and floating change of Debenture holders are treated as unsecured creditors.
4. **No voting rights:** Debenture holders are considered as creditors of the company. Hence they have no voting rights. Debenture holders cannot have the control over the performance of the business concern.
5. **Fixed rate of interest:** Debentures yield fixed rate of interest till the maturity period. Hence the business will not affect the yield of the debenture.

Advantages of Debenture

Debenture is one of the major parts of the long-term sources of finance which of consists the following important advantages:

1. **Long-term sources:** Debenture is one of the long-term sources of finance to the company. Normally the maturity period is longer than the other sources of finance.
2. **Fixed rate of interest:** Fixed rate of interest is payable to debenture holders, hence it is most suitable of the companies earn higher profit. Generally, the rate of interest is lower than the other sources of long-term finance.
3. **Trade on equity:** A company can trade on equity by mixing debentures in its capital structure and thereby increase its earning per share. When the company apply the trade on equity concept, cost of capital will reduce and value of the company will increase.
4. **Income tax deduction:** Interest payable to debentures can be deducted from the total profit of the company. So it helps to reduce the tax burden of the company.
5. **Protection:** Various provisions of the debenture trust deed and the guidelines issued by the SEB1 protect the interest of debenture holders.

Disadvantages of Debenture

Debenture finance consists of the following major disadvantages:

1. **Fixed rate of interest:** Debenture consists of fixed rate of interest payable to securities. Even though the company is unable to earn profit, they have to pay the fixed rate of interest to debenture holders, hence, it is not suitable to those company earnings which fluctuate considerably.

2. **No voting rights:** Debenture holders do not have any voting rights. Hence, they cannot have the control over the management of the company.
3. **Creditors of the company:** Debenture holders are merely creditors and not the owners of the company. They do not have any claim in the surplus profits of the company.
4. **High risk:** Every additional issue of debentures becomes more risky and costly on account of higher expectation of debenture holders. This enhanced financial risk increases the cost of equity capital and the cost of raising finance through debentures which is also high because of high stamp duty.
5. **Restrictions of further issues:** The company cannot raise further finance through debentures as the debentures are under the part of security of the assets already mortgaged to debenture holders.

INTERNAL FINANCE

A company can mobilize finance through external and internal sources. A new company may not raise internal sources of finance and they can raise finance only external sources such as shares, debentures and loans but an existing company can raise both internal and external sources of finance for their financial requirements. Internal finance is also one of the important sources of finance and it consists of cost of capital while compared to other sources of finance.

Internal source of finance may be broadly classified into two categories:

A. Depreciation Funds
B. Retained earnings

Depreciation Funds

Depreciation funds are the major part of internal sources of finance, which is used to meet the working capital requirements of the business concern. Depreciation means decrease in the value of asset due to wear and tear, lapse of time, obsolescence, exhaustion and accident. Generally depreciation is changed against fixed assets of the company at fixed rate for every year. The purpose of depreciation is replacement of the assets after the expired period. It is one kind of provision of fund, which is needed to reduce the tax burden and overall profitability of the company.

Retained Earnings

Retained earnings are another method of internal sources of finance. Actually is not a method of raising finance, but it is called as accumulation of profits by a company for its expansion and diversification activities.

Retained earnings are called under different names such as; self finance, inter finance, and plugging back of profits. According to the Companies Act 1956 certain percentage, as prescribed by the central government (not exceeding 10%) of the net profits after tax of a

financial year have to be compulsorily transferred to reserve by a company before declaring dividends for the year.

Under the retained earnings sources of finance, a part of the total profits is transferred to various reserves such as general reserve, replacement fund, reserve for repairs and renewals, reserve funds and secrete reserves, etc.

Advantages of Retained Earnings

Retained earnings consist of the following important advantages:

1. **Useful for expansion and diversification**: Retained earnings are most useful to expansion and diversification of the business activities.
2. **Economical sources of finance:** Retained earnings are one of the least costly sources of finance since it does not involve any floatation cost as in the case of raising of funds by issuing different types of securities.
3. **No fixed obligation:** If the companies use equity finance they have to pay dividend and if the companies use debt finance, they have to pay interest. But if the company uses retained earnings as sources of finance, they need not pay any fixed obligation regarding the payment of dividend or interest.
4. **Flexible sources:** Retained earnings allow the financial structure to remain completely flexible. The company need not raise loans for further requirements, if it has retained earnings.
5. **Increase the share value:** When the company uses the retained earnings as the sources of finance for their financial requirements, the cost of capital is very cheaper than the other sources of finance; Hence the value of the share will increase.
6. **Avoid excessive tax:** Retained earnings provide opportunities for evasion of excessive tax in a company when it has small number of shareholders.
7. **Increase earning capacity:** Retained earnings consist of least cost of capital and also it is most suitable to those companies which go for diversification and expansion.

Disadvantages of Retained Earnings

Retained earnings also have certain disadvantages:

1. **Misuses:** The management by manipulating the value of the shares in the stock market can misuse the retained earnings.
2. **Leads to monopolies:** Excessive use of retained earnings leads to monopolistic attitude of the company.
3. **Over capitalization:** Retained earnings lead to over capitalization, because if the company uses more and more retained earnings, it leads to insufficient source of finance.
4. **Tax evasion:** Retained earnings lead to tax evasion. Since, the company reduces tax burden through the retained earnings.

5. **Dissatisfaction:** If the company uses retained earnings as sources of finance, the shareholder can't get more dividends. So, the shareholder does not like to use the retained earnings as source of finance in all situations.

LOAN FINANCING

Loan financing is the important mode of finance raised by the company. Loan finance may be divided into two types:

(a) Long-Term Sources
(b) Short-Term Sources

Loan finance can be raised through the following important institutions.

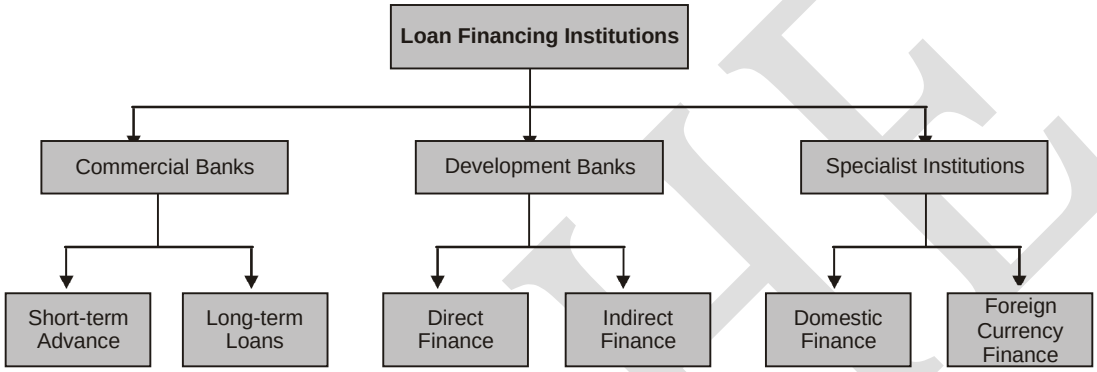


Fig. 3.1 *Loan Financing*

Financial Institutions

With the effect of the industrial revaluation, the government established nation wide and state wise financial industries to provide long-term financial assistance to industrial concerns in the country. Financial institutions play a key role in the field of industrial development and they are meeting the financial requirements of the business concern. IFCI, ICICI, IDBI, SFC, EXIM Bank, ECGC are the famous financial institutions in the country.

Commercial Banks

Commercial Banks normally provide short-term finance which is repayable within a year. The major finance of commercial banks is as follows:

Short-term advance: Commercial banks provide advance to their customers with or without securities. It is one of the most common and widely used short-term sources of finance, which are needed to meet the working capital requirement of the company.

It is a cheap source of finance, which is in the form of pledge, mortgage, hypothecation and bills discounted and rediscounted.

Short-term Loans

Commercial banks also provide loans to the business concern to meet the short-term financial requirements. When a bank makes an advance in lump sum against some security it is termed as loan. Loan may be in the following form:

(a) **Cash credit**: A cash credit is an arrangement by which a bank allows his customer to borrow money up to certain limit against the security of the commodity.

(b) **Overdraft**: Overdraft is an arrangement with a bank by which a current account holder is allowed to withdraw more than the balance to his credit up to a certain limit without any securities.

Development Banks

Development banks were established mainly for the purpose of promotion and development the industrial sector in the country. Presently, large number of development banks are functioning with multidimensional activities. Development banks are also called as financial institutions or statutory financial institutions or statutory non-banking institutions. Development banks provide two important types of finance:

(a) Direct Finance

(b) Indirect Finance/Refinance

Some of the important development banks are discussed in Chapter 11.

Presently the commercial banks are providing all kinds of financial services including development-banking services. And also nowadays development banks and specialisted financial institutions are providing all kinds of financial services including commercial banking services. Diversified and global financial services are unavoidable to the present day economics. Hence, we can classify the financial institutions only by the structure and set up and not by the services provided by them.

MODEL QUESTIONS

1. Explain the various sources of financing.
2. What is meant by security financing?
3. What is debt financing?
4. Critically examine the advantages and disadvantages of equity shares.
5. Discuss the features of equity shares.
6. What are the merits of the deferred shares?
7. Explain the merits and demerits of preference shares?
8. List out the types of debentures.

9. Evaluate the overall view of debentures.
10. How internal sources of finance is used in the industrial concern?
11. What is retained earnings?
12. Evaluate the advantages and disadvantages of retained earnings.
13. How does depreciation funds help the industrial concern as sources of finance?
14. Evaluate the overall structure of the loan financing?
15. Explain the Commercial Bank financing?
16. Enumerate the major development banks.
17. Explain the role of UTI and LIC in industrial financing?
18. What is cash credit?
19. Mention the functions of IFCI.

Managerial finance _____	involves the design and delivery of advice and financial products.
Finance can be defined as _____	the system of debits and credits.
The officer responsible for the firm's financial activities such as financial planning and fund raising, making capital expenditure decisions, and managing cash, credit, the pension fund, and foreign exchange is _____ treasurer.	foreign exchange manager.
The officer responsible for the firm's accounting activities, such as corporate accounting, tax management, financial accounting, and cost accounting is the _____	foreign exchange manager.
Which of the following legal forms of organization is characterized by limited liability? _____	Professional partnership.
In a(n) _____, owners have limited liability with regard to the business. They are not personally liable for the malpractice of other owners.	S-corporation
The amount earned during the accounting period on each outstanding share of common stock is called _____	net income.
Managerial finance _____	devotes the majority of its attention to the collection and presentation of financial data.
The key role of the financial manager is _____	the presentation of financial statements.
The key activities of the financial manager include all of the following EXCEPT _____	managing financial accounting.
Making investment decisions includes all of the following EXCEPT _____	fixed assets.
The financial manager may be responsible for any of the following EXCEPT _____	determining whether to accept or reject a capital asset acquisition.

Making financing decisions includes all of the following EXCEPT _____	analyzing quarterly budget and performance reports.
Managing the firm's assets includes all of the following EXCEPT _____	fixed assets.
Managing the firm's liabilities includes all of the following EXCEPT _____	accruals.
Financial analysis and planning involve all of the following EXCEPT _____	evaluating the need for increased or reduced productive capacity.
In planning and managing the requirements of the firm, the financial manager is concerned with _____	the acquisition of fixed assets,
The financial manager's financing decisions determine _____	the most appropriate mix of short-term and long-term financing.
If a company's managers are NOT owners of the company, then they are _____	dealers.
The conflict between the goals of a firm's owners and the goals of its non-owner managers is _____	the agency problem.
The agency problem may result from a manager's concerns about any of the following EXCEPT _____	company-provided perquisites.
Agency costs include all of the following EXCEPT _____	monitoring expenditures.

The true owner(s) of the corporation is (are) the _____	creditors.
The _____ has/have the ultimate responsibility in guiding corporate affairs and carrying out policies.	stockholders
The responsibility for managing day-to-day operations and carrying out corporate policies belongs to the _____	chief executive officer.
In a corporation, the members of the board of directors are elected by the _____	chief executive officer.
The primary goal of a financial manager is _____.	maximizing profit
The wealth of the owners of a corporation is represented by _____.	earnings per share
corporate owners earn a return _____.	through capital appreciation and retained earnings
Finance is _____.	the science of the production,
_____ decisions focus on how a company will spend its financial resources on long-term projects that ultimately determine whether the firm successfully creates value for its owners.	Financing
The primary principle that finance borrows from economics is _____.	shareholder value maximization
Which of the following activities of a finance manager determines the types of assets the firm holds?	financing decisions
The money that firms raise to finance their activities is called _____.	capital
A treasurer is commonly responsible for handling _____.	investing surplus funds
Which of the following is TRUE of accrual basis accounting?	Revenue is recognized when a customer pays cash or shows interest to purchase the product or service.
As the risk of a stock investment increases, investors' _____.	return will increase

The principal-agent problem arises when _____.	a firm is organized as a sole proprietorship
_____ decisions refer to how a firm manages its short-term resources on a day-to-day basis.	Working capital
The _____ has a role that focuses on budgeting, accounting, and tracking the performance of a single business unit.	treasurer
Which of the following legal forms of organization has the ease of dissolution?	sole proprietorships
under which of the following legal forms of organization is ownership readily transferable?	partnerships
Which of the following forms of organizations is the easiest to form?	sole proprietorships
A major weakness of a partnership is _____.	the difficulty in maintaining owners' control
Which of the following is a strength of a corporation?	low organization costs
Which of the following legal forms of organizations is characterized by unlimited liability?	limited partnership
Agency costs are _____.	costs that are exempt from taxation
The board of directors is typically responsible for _____.	arranging finance for approved long-term investments
Which of the following is an example of agency cost?	payment of income tax
Which of the following is a routine way that boards try to align the interests of managers and stockholders?	tie management compensation to the performance of the company's common stock price

As a key participant in financial transactions, individuals are _____.	net purchasers of funds because they save more money than they borrow
Firms that require funds from external sources can obtain them _____.	through financial institutions
Which of the following serves as an intermediary channeling the savings of individuals, businesses, and governments into loans and investments?	OTC market
which of the following provides savers with a secure place to invest funds and offer both individuals and companies loans to finance investments?	commercial banks
Which of the following is TRUE of a primary market?	It is a market where smaller, unlisted securities are traded.
Which of the following is TRUE of a secondary market?	It is a market in which short-term money market instruments such as Treasury bills are traded.
Which of the following is TRUE of preferred stock?	It has features of bonds and a common stock.
The key securities traded in the capital markets are _____.	bills of exchange and commercial papers
The _____ is created by a number of institutions and arrangements that allow the suppliers and demanders of long-term funds to make transactions.	capital market
Long-term debt instruments used by both government and business are known as _____.	T-bills

devotes the majority of its attention to the collection and presentation of financial data.	recognizes funds on an accrual basis.	involves tasks such as budgeting, financial forecasting, cash management, and funds procurement.
the science of the production, distribution, and consumption of wealth.	the art of merchandising products and services.	the art and science of managing money.
treasurer.	controller.	none of the above.
treasurer.	controller.	none of the above.
Corporation.	Sole proprietorship.	Partnership.
partnership	limited partnership	limited liability partnership
net profits after taxes.	common stock dividend.	earnings per share.
recognizes funds on an accrual basis.	involves tasks such as budgeting, financial forecasting, cash management, and funds procurement.	involves the design and delivery of advice and financial products.
the preparation of data for future evaluation.	decision making.	the collection of financial data.
making financing decisions.	making investment decisions.	financial analysis and planning.
accounts receivable.	inventory.	notes payable.
analyzing the effects of more debt on the firm's capital structure.	analyzing budget and performance reports.	monitoring of quarterly tax payments.

deciding which individual long-term sources are best at a given point in time.	determining the appropriate mix of short-term and long-term financing.	deciding which individual short-term sources are best at a given point in time.
accounts receivable.	notes payable.	inventory.
accounts payable.	cash.	notes payable.
controlling the data processing activities.	transforming data into a form that can be used to monitor the firm's financial position.	determining the additional financing needs.
allowing someone else to plan the level of current assets required.	the mix and type of assets, the type of financing utilized, and analysis in order to monitor the financial condition.	the type of financing utilized, but not the mix and type of assets. the mix and type of assets, but not the type of financing utilized.
both the mix and the type of assets and liabilities found on the firm's balance sheet.	the proportion of the firm's earnings to be paid as dividend.	both the mix and the type of assets found on the firm's balance sheet.
brokers.	outsiders.	agents.
incompatibility.	of little importance in most large U.S. firms.	serious only when profits decline.
personal wealth.	corporate goals.	job security.
cost of goods sold.	bonding and structuring expenses.	opportunity costs.

stockholders.	board of directors.	chief executive officer.
board of directors	creditors	chief executive officer
stockholders.	board of directors.	creditors.
employees.	stockholders.	creditors.
minimizing risk	maximizing wealth	minimizing return
cash flow	share value	profits
through interest earnings and earnings per share by realizing gains	through increases in share price and interest earnings by realizing gains	through increases in share price and cash dividends
distribution, and consumption of goods and services the system of verifying, analyzing, and recording business transactions	the art of merchandising products and services the science and	art of how individuals and businesses raise, allocate, and invest money
Investment	Working capital	Risk management
generally accepted accounting principles	marginal cost-benefit analysis	cash is king
investment decisions	analyzing and planning	cash flows budget allocation
accruals	working capital	the capital budget
cost accounting	tax management	corporate accounting
Expenses are recognized when they are incurred.	Expenses are recognized either when they are incurred or cash is paid.	Revenue is recognized when a customer pays cash.
required rate of return will decrease	return will decrease	required rate of return will increase

the owners of the firm are not the people managing the firm	managers serve on a firm's board of directors	the owners of the firm also manage the firm
Financing	Managerial finance	Investment
director of risk management	chief financial officer	controller
partnerships	corporations	limited partnerships
corporations	sole proprietorships	limited partnerships
S-corporations	limited partnership	limited liability corporation
its high organizational costs	the double taxation of income	the difficulty in liquidating or transferring ownership
low taxes	limited liability	less government regulation
sole proprietorship	corporation	C-corporation
costs that firms must pay to comply with the regulations imposed by federal government agencies	costs that shareholders bear because managers pursue their own interests rather than acting in the interests of shareholders	costs that managers bear when they do not act in the interests of shareholders
managing day-to-day operations	approving strategic goals and plans	maintaining and controlling the firm's daily cash balances
failure to make an investment that would make shareholders wealthier	payment of interest	costs incurred for setting up an agency
fire managers who are inefficient	remove management's perquisites	tie management compensation to the level of dividend per share

net users of funds because they save less money than they borrow	net suppliers of funds because they save more money than they borrow	net demanders of funds because they save more money than they borrow
by issuing T-bills	through the foreign exchange market	from central bank directly
Securities and Exchange Commission	financial markets	financial institutions
investment banks	mutual funds	securities exchanges
It is an organized market in which all financial derivatives are traded.	It is regulated by The Sarbanes-Oxley Act.	It is the only market in which the issuer is directly involved in the transaction.
It is a market in which preowned securities are traded.	It is a market for an unlisted company to raise equity capital.	It is a market where securities are issued through private placement
Its dividends can be paid only after paying dividends to the common stockholders.	It usually has a maturity of thirty years.	It has a claim on assets prior to creditors in the event of liquidation.
stocks and bonds	Treasury bills and certificates of deposit	commercial papers and Treasury bills
money market	forex market	commodities market
equities	bonds	preferred stocks

involves tasks such as budgeting, financial forecasting, cash management, and funds procurement.
the art and science of managing money.
treasurer
Controller
Corporation.
limited liability partnership
earnings per share.
involves tasks such as budgeting, financial forecasting, cash management, and funds procurement.
decision making.
managing financial accounting.
notes payable.
monitoring of quarterly tax payments.

analyzing quarterly budget and performance reports.
notes payable.
cash.
controlling the data processing activities.
allowing someone else to plan the level of current assets required.
the most appropriate mix of short-term and long-term financing.
agents.
the agency problem.
corporate goals.
monitoring expenditures.

creditors.
stockholders
chief executive officer.
stockholders.
maximizing wealth
share value
through increases in share price and cash dividends
art of how individuals and businesses raise, allocate, and invest money
Investment
marginal cost-benefit analysis
investment decisions
capital
investing surplus funds
Expenses are recognized when they are incurred.
required rate of return will increase

the owners of the firm are not the people managing the firm
Working capital
controller
sole proprietorships
corporations
sole proprietorships
the difficulty in liquidating or transferring ownership
limited liability
sole proprietorship
costs that shareholders bear because managers pursue their own interests rather than acting in the interests of shareholders
approving strategic goals and plans
failure to make an investment that would make shareholders wealthier
tie management compensation to the performance of the company's common stock price

net suppliers of funds because they save more money than they borrow
through financial institutions
financial institutions
commercial banks
It is the only market in which the issuer is directly involved in the transaction.
It is a market in which preowned securities are traded.
It has features of bonds and a common stock.
stocks and bonds
capital market
bonds

TIME VALUE OF MONEY

Concept

We know that Rs. 100 in hand today is more valuable than Rs. 100 receivable after a year. We will not part with Rs. 100 now if the same sum is repaid after a year. But we might part with Rs. 100 now if we are assured that Rs. 110 will be paid at the end of the first year. This "additional Compensation" required for parting Rs. 100 today, is called "interest" or "the time value of money". It is expressed in terms of percentage per annum.

Why should money have time value?

Money should have time value for the following reasons :

(a) Money can be employed productively to generate real returns;

(b) In an inflationary period, a rupee today has higher purchasing power than a rupee in the future;

(c) Due to uncertainties in the future, current consumption is preferred to future consumption.

(d) The three determinants combined together can be expressed to determine the rate of interest as follows :

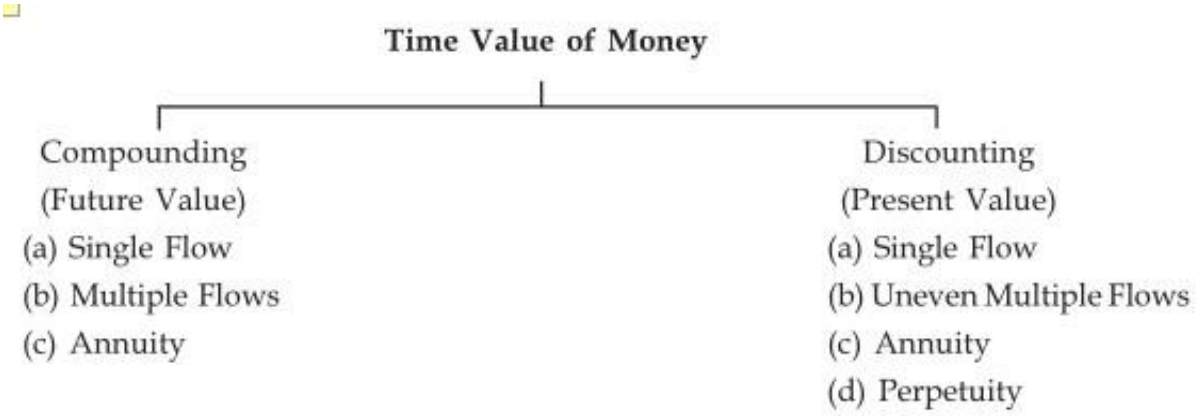
Nominal or market interest rate

= Real rate of interest or return (+) Expected rate of inflation (+) Risk premiums to compensate for uncertainty.

Methods of Time Value of Money

(1) Compounding : We find the Future Values (FV) of all the cash flows at the end of the time period at a given rate of interest.

(2) Discounting : We determine the Time Value of Money at Time "O" by comparing the initial outflow with the sum of the Present Values (PV) of the future inflows at a given rate of interest.



Future Value of a Single Flow

It is the process to determine the future value of a lump sum amount invested at one point of time.

$$FV\ n = PV\ (1+i)\ n$$

Where,

FV n = Future value of initial cash outflow after n years

PV = Initial cash outflow

i = Rate of Interest p.a.

n = Life of the Investment

and (1+i) n = Future Value of Interest Factor (FVIF)

Illustration :

The fixed deposit scheme of Punjab National Bank offers the following interest rates :

Period of Deposit	**Rate Per Annum**
46 days to 179 days	5.0
180 days < 1 year	5.5
1 year and above	6.0

An amount of Rs. 15,000 invested today for 3 years will be compounded to :

FV n = PV (1+i) n

= PV × FVIF (6,3)

= PV × (1.06) 3

= 15,000 (1.191)

= Rs. 17,865

Future Value of Annuity

Annuity is a term used to describe a series of periodic flows of equal amounts. These flows can be inflows or outflows.

The future value of annuity is expressed as :

$$FVA_n = A\left[\frac{(1+i)^n - 1}{i}\right]$$

where, A = Amount of Annuity

i = rate of interest

n = time period

FVA_n = compounded at the end of n years.

and $\left[\frac{(1+i)^n - 1}{i}\right]$ is the Future Value of Interest Factor for Annuity (FVIFA)

Illustration :

Calculation the maturity value of a recurring deposit of Rs. 500 p.a. for 12 months @ 9% p.a. compounded quarterly.

Solution :

Effective rate of interest per annum $= \left(1+\frac{0.09}{4}\right)^4 - 1$

$= 1.0931 - 1 = 0.0931$

Rate of interest per month

$= (1+i)^{\frac{1}{m}} - 1$

$= (1+0.0931)^{\frac{1}{12}} - 1$

$= 1.0074 - 1$

$= 0.0074$

$= 0.74\%$

Maturity Value can be calculated as follows :

$$FVAn = A\left\{\frac{(1+i)^n - 1}{i}\right\}$$

$$= 500\left\{\frac{(1+0.0074)^{12} - 1}{0.0074}\right\}$$

$= 500 \times 12.50 =$ Rs. 6250/-

Present Value of a Single Flow :

$$PV = \frac{FV_n}{FVIF(i,n)} = \frac{FV_n}{(1+i)^n}$$

Where, PV = Present Value

FV_n = Future Value receivable after n years

i = rate of interest

n = time period

and $\frac{1}{FVIF(i,n)} = PVIF(i,n)$ [Present Value of Interest Factor]

Present Value of Uneven Multiple Flows

Year	Cash Inflows	P.V.F @ 10%	Discounted Cash Flows
1	50,000	0.9091	45,455
2	90,000	0.8264	74,376
3	1,20,000	0.7513	90,156

2,60,000 2,09,987

∴ The present value of Rs. 2,60,000 discounted @ 10% will be Rs. 2,09,987.

Present Value of Even Cash Inflows

Calculate P.V. of Rs. 50,000 receivable for 3 years @ 10%

P.V. = Cash Flows × Annuity @ 10% for 3 years.

= 50,000 × 2.4868 = Rs. 1,24,340/-

Present Value of an Annuity

The present value of an annuity „A" receivable at the end of every year for a period of n years at the rate of interest „i" is equal to

$$PVA_n = \frac{A}{(1+i)} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)^3} + \frac{A}{(1+i)^n}$$

$$= A\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$$

Where, $\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$ is called the PVIFA (Present Value of Interest Factor Annuity) and it represents the present value of Rs. 1 for the given values of i and n.

RISK AND RETURN

Expected Return and Variance

- "What is the chance of an investment's price or return going up and down?"
- Investment risk

Expected Return: Return on a risky asset expected in the future

$$E(R_i) = \sum_{s=1}^{S} p(s) * R(s)_i$$

where $p(s)$ denotes the probability of state s, $R(s)$ denotes the return in state s.

Variance: Measures the dispersion of an asset's returns around its expected return.

$$var(R_i) = \sum_{s=1}^{S} p(s) * \left[R(s)_i - E(R_i) \right]^2$$

Standard deviation: The square root of the variance.

Expected Return and Variance

Example: What is the expected return to the amusement park and ski resort stock?

State of weather	Probability	Return on amusement park stock	Return on ski resort stock
Very Cold	0.1	-15%	35%
Cold	0.3	-5%	15%
Average	0.4	10%	5%
Hot	0.2	30%	-5%

Mean or expected value:

$E(X) = prob_1X_1 + prob_2X_2 + ... + prob_nX_n =$

Where i = one possible outcome

$prob_I$ = the probability of outcome i

X_i = the return if outcome i happens

n = the total number of possible outcomes

Example: Let A denote the amusement park and S denote the ski resort

$E(R_A) = 0.1\ (-0.15) + 0.3\ (-0.05) + 0.4\ (0.10) + 0.2\ (0.30) = 7.00\%$

$E(R_S) = 0.1\ (-0.35) + 0.3\ (0.15) + 0.4\ (0.05) + 0.2\ (-0.05) = 9.00\%$

Variance and standard deviation:

Variance of $X = \sum_{i=1}^{n} (prob_i [x_i - (E(x)]^2)$

Standard deviation=$(var)^{1/2}$

For the amusement park and the ski resort we have:

$$\sigma_A = \sqrt{0.1(-0.150 - .07)_2 + 0.3(-0.050 - .07)_2 + 0.4(0.10 - .07)_2 + 0.2(0.30 - .07)_2} = 14.18\%$$

$$\sigma_S = \sqrt{0.1(0.350 - .09)_2 + 0.3(0.150 - .09)_2 + 0.4(0.050 - .09)_2 + 0.2(-0.050 - .09)_2} = 11.14\%$$

The standard deviation is a measure of **stand-alone risk**.

Risk: Systematic and Unsystematic

Stand-alone risk is measured by dispersion of returns about the mean and is relevant *only* for assets held in isolation. It consists of:

- Diversifiable (company-specific, unique, or unsystematic)
- Non-diversifiable (market or systematic)

Risk	Type of Risk
Risk of inflation	
Risk of a CEO resigning	
Risk of a takeover	
Risk of a labor strike	

Coefficient of Variation - Standardized measure of dispersion about the expected value. Shows risk per unit of return.

Covariance and correlation

It is important in portfolio theory to know how two stocks move together, or how a stock moves with the market. There are two measures of this, covariance and correlation.

We can calculate the covariance as follows:

Covariance of X and Y = $COV_{xy} = \sum_{i=1} prob_i \left(X_i - E(R_X)\right) \times \left(Y_i - E(R_Y)\right)$

For the amusement park and the ski resort we have:

Cov_{AS} = 0.1(-0.150 -.07)(0.350 -.09) + 0.3(-0.050 -.07)(0.150 -.09)

+ 0.4(0.10.-.07)(0.050 -.09) + 0.2(0.30 -.07)(-0.050 -.09) = - 0.0148

The negative covariance tells you that the stocks tend to move in opposite directions.

The covariance gives you a sense of both the magnitude and the direction of how stocks move together. Sometimes it is useful to have a measure of how stock move together, which is independent of the size of the "swings", and just gives an idea of how tightly two stock "track" each other.

We can calculate the correlation coefficient as follows.

$$Corr_{XY} = \frac{Cov_{XY}}{\sigma_X \sigma_Y}$$

The correlation coefficient is always between -1.0 and 1.0:

$$-1.0 \le Corr_{XY} \le 1.0$$

For the amusement park and the ski resort we find the correlation is:

$$Corr_{XY} = \frac{Cov_{XY}}{\sigma_X \sigma_Y} = \frac{-0.0148}{(0.1418)(0.1114)} = -0.93746$$

Portfolios

Portfolio: A group of securities, such as stocks and bonds, held by an investor.

Portfolio weights: Percentages of the portfolio's total value invested in each security.

Example: Your portfolio consists of IBM stock and GM stock. You have $2,500 invested in IBM and $7,500 invested in GM. What are the portfolio weights?

Expected Return on a portfolio: Weighted average of the expected returns on the individual securities in the portfolio. Let w_n denote a security's portfolio weight, then

$$E(R_p) = \sum_{n=1}^{N} [w_n E(R_n)]$$

Portfolio Variance: Unlike the expected return, the variance of a portfolio is not a simple weighted average of the individual security variances,

$$Var(R_p) = w_a^2 var(R_A) + w_B^2 var(R_A) + 2\, w_A w_B cov(R_A, R_B)$$

We can use this formula or we can compute the returns for the portfolio and then computes its expected return and variance.

Example: **Expected Return and Variance of Portfolio Returns**

In our earlier example, there are two stocks, the Amusement Park and the Ski Resort.

We know the following:

$E(R_A) = 7\%$ $E(R_S) = 9\%$

$\sigma_A = 14.18\%$ $\sigma_S = 11.14\%$

Say we have $100 and invest $50 into *A* and $50 into *S*. What can we expect to make on our portfolio?

We have a weight of 50% in A and 50% in S (the weights don't have to be 50-50)

$$E(R_p) = 0.5\,(7\%) + 0.5\,(9\%) = 8\%$$

Generally, expected portfolio return = $E(R_p) = \sum w_i \times E(r_i)$

Expected portfolio risk

To measure the risk of the portfolio, we have to account for how the stocks move together. For two stocks X and Y the relation is:

$$SD(R_p) = \sqrt{W_X^2 \sigma_X^2 + W_Y^2 \sigma_Y^2 + 2 \times W_X W_Y Cov_{XY}}$$

Where: W_X = % of wealth in asset X

W_Y = % of wealth in asset Y

$W_X + W_Y = 1$

And $Cov_{XY} = Corr_{XY}\, \sigma_X\, \sigma_Y$

As the covariance gets more negative, the portfolio can be made less risky.

Risk - Return tradeoffs.

In the Ski Resort example, say we divide our money 50-50 between the two stocks.

The correlation between the two stocks is -0.9375, $\sigma_A = 14.18\%$, $\sigma_S = 11.14\%$,

$W_A = 0.5$, $W_S = 0.5$.

So:

$$Cov_{XY} = Corr_{XY}\,\sigma_X\,\sigma_Y = -0.9374 \times 0.1418 \times 0.1114 = -0.0148$$

And:

$$SD(R_p) = \sqrt{(0.5)^2(.1418)^2 + (0.5)^2(.1114)^2 + 2(0.5)(0.5)(-0.0148)} = 2.70\%$$

Our answer tells us something very important - the risk of the portfolio of the two stocks is less than the risk of either one by itself.

In general, the lower the correlation between the stocks the lower the risk of the portfolios of both stocks.

As a reminder, so far we have found the following:

$E(R_A) = 7\%$ $E(R_S) = 9\%$

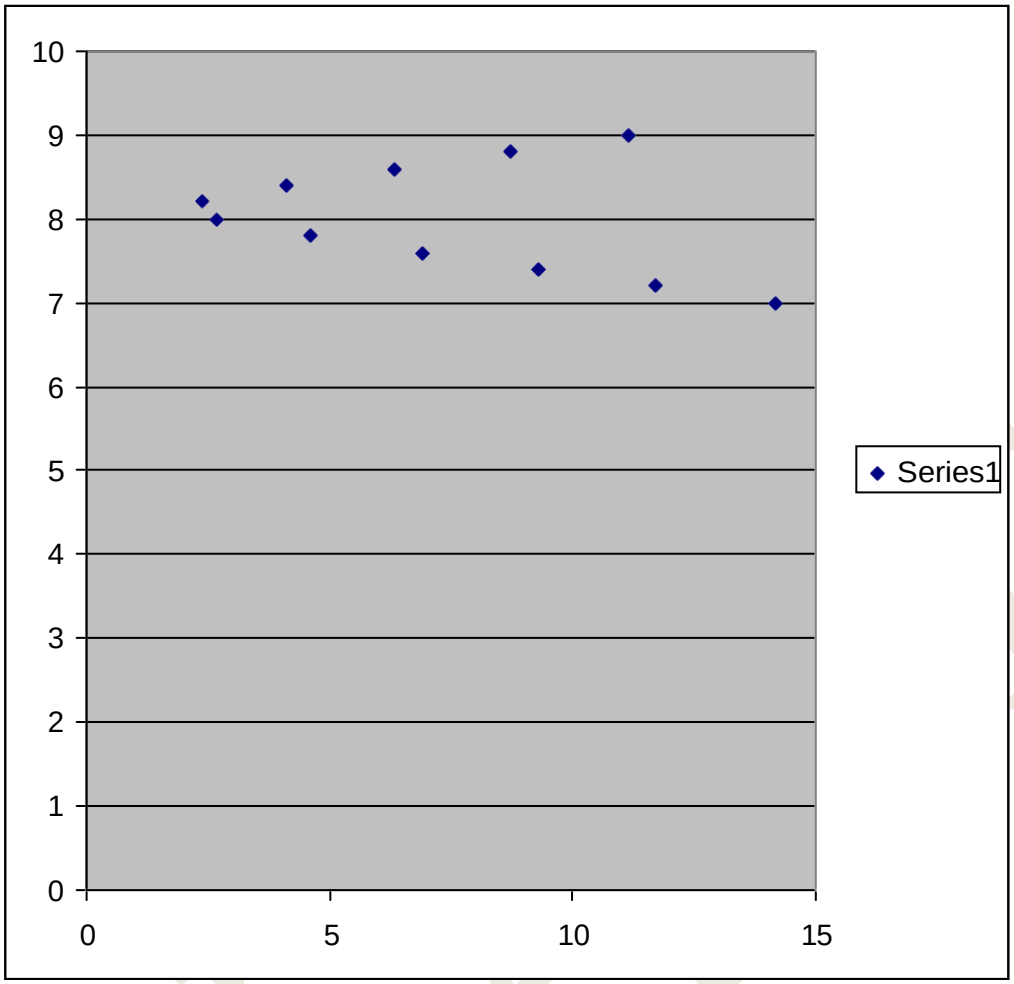
$\sigma_A = 14.18\%$ $\sigma_S = 11.14\%$ $Corr_{AS} = -0.9375$

And we have the portfolio expected returns and portfolio standard deviations:

W_A (%)	W_B (%)	$SD(R_P)$ (%)	$E(R_P)$ (%)
100.00	0.00	14.18	7.00
90.00	10.00	11.72	7.20
80.00	20.00	9.29	7.40

70.00	30.00	6.89	7.60
60.00	40.00	4.60	7.80
50.00	50.00	2.69	8.00
40.00	60.00	2.40	8.20
30.00	70.00	4.09	8.40
20.00	80.00	6.33	8.60
10.00	90.00	8.71	8.80
0.00	100.00	11.14	9.00

We can plot these risk-return combinations in a graph:



Risk Free Asset

Say that we have 2 assets, X and Y, but Y is risk free, i.e., $\sigma_Y = 0$.

Then:

$$E(R_p) = W_X E(R_X) + W_Y E(R_Y)$$

$$SD(R_p) = \sqrt{W_X^2 \sigma_X^2 + W_Y^2 \sigma_Y^2 + 2 \times W_X W_Y Cov_{XY}}$$

or

$$SD(R_p) = \sqrt{W_X^2 \sigma_X^2 + W_Y^2 \sigma_Y^2 + 2 \times W_X W_Y \sigma_X \sigma_Y Corr_{XY}} = W_X \sigma_X$$

Let's say that there is a risky asset (X) and a risk free asset (F)

Risky Asset: $E(R_X) = 0.16$, $\sigma_X = 8\%$

Risk Free Asset: $E(R_F) = 0.06$, $\sigma_F = 0\%$

You have \$100, you put \$50 in X and \$50 in F (i.e., lending \$50 at the risk free rate). The weights are:

$$W_X = \frac{amount\ in\ X}{my\ initial\ wealth} = \frac{50}{100} = 0.50$$

$$W_F = \frac{amount\ in\ F}{my\ initial\ wealth} = \frac{50}{100} = 0.50$$

$E(R_p) = W_X E(R_X) + W_Y E(R_Y) = 0.5\ (16) + 0.5\ (6) = 11\%$

$SD(R_P) = W_X \sigma_X = 0.5\ (8) = 4\%$

You have \$100 and you borrow \$50 from F and put \$150 in X

$$W_X = \frac{amount\ in\ X}{my\ initial\ wealth} = \frac{150}{100} = 1.50$$

$$W_F = \frac{amount\ in\ F}{my\ initial\ wealth} = \frac{-50}{100} = -0.50$$

Note: the weights always add up to 1.0.

$E(R_p) = W_X E(R_X) + W_Y E(R_Y) = 1.5\ (16\%) + (-0.5)\ (6\%) = 21\%$

$SD(R_P) = W_X \sigma_X = 1.5\ (8) = 12\%$

If we compute the expected return and standard deviation for a variety of weights, we can build a table as we did before:

W_F (%)	W_X (%)	SD(R_P) (%)	E(R_P) (%)
100.00	0.00	0.00	6.00
80.00	20.00	1.60	8.00
50.00	50.00	4.00	11.00
20.00	80.00	6.40	14.00
0.00	100.00	8.00	16.00
-50.00	150.00	12.00	21.00

And plot the expected portfolio return vs. the standard deviation:

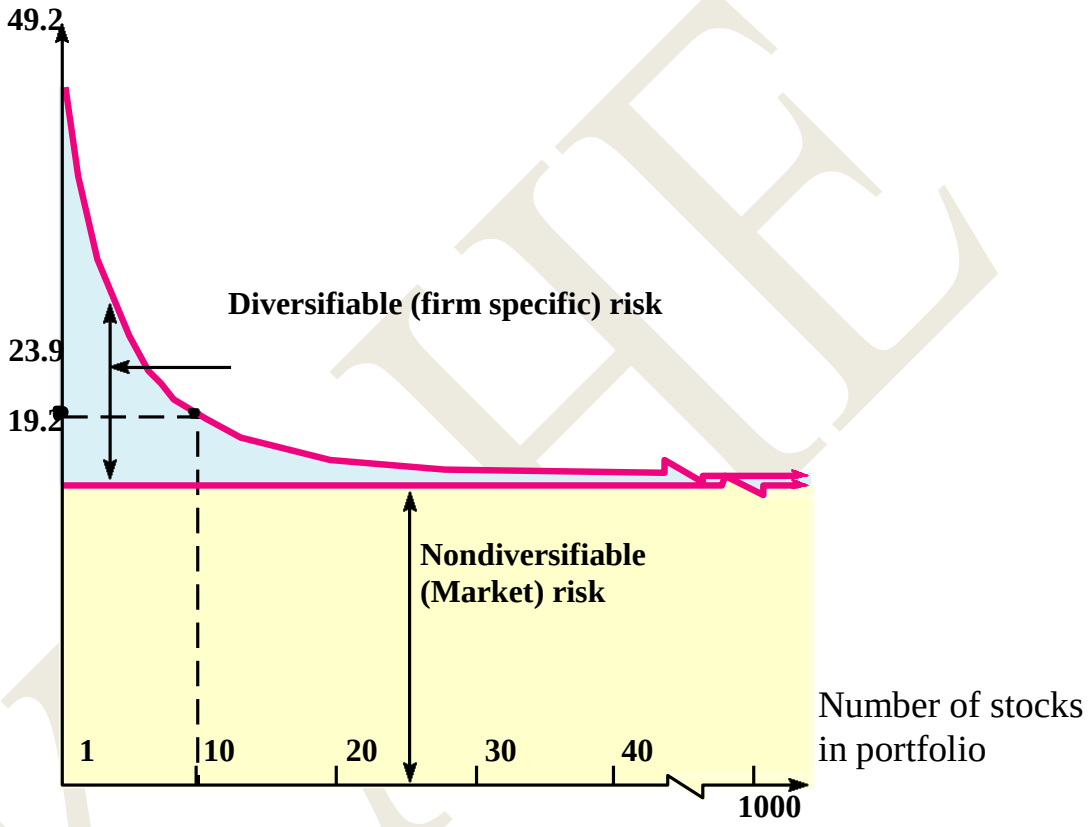
In our return - standard deviation graph, when we combine a risk free asset with a risky asset the risk - return tradeoff is a straight line.

Diversification

Principle of Diversification: Spreading an investment across a number of assets will eliminate some, but not all, of the risk. Diversification is not putting all your eggs in one basket.

- A typical NYSE stock has a standard deviation of annual returns of 49.24%, while the typical portfolio of 100 or more stocks has a standard deviation just under 20%.
- **Diversifiable risk:** The variability present in a typical single security that is not present in a portfolio of securities.
- **Nondiversifiable risk:** The level of variance that is present in a collection or portfolio of assets.

Portfolio Diversification (Figure 13.1)



Systematic Risk and Beta

The Systematic Risk Principle

- The reward for bearing risk depends only upon systematic risk of investment since unsystematic risk can be diversified away.
- This implies that the expected return on any asset depends only on that asset's systematic risk

Measuring Systematic Risk

- ***Beta,*** **;**is a measure of how much systematic risk an asset has relative to an average risky asset. An example of an average risky asset is the market portfolio. An example of the market portfolio is the S&P index.

- **Portfolio Betas:** While portfolio variance is not equal to a simple weighed sum of individual security variances, portfolio betas are equal to the weighed sum of individual security betas.

$$\beta_P = \sum_{i=1}^{N} w_i \beta_i$$

- You have $6,000 invested in IBM, $4,000 in GM. The beta of IBM and GM is 0.75 and 1.2 respectively. What is the beta of the portfolio?

Calculating Betas

Run a regression line of past returns on Stock *i* versus returns on the market.

The regression line is called the characteristic line.

The slope coefficient of the characteristic line is defined as the beta coefficient.

- If beta = 1.0, stock is average risk.
- If beta > 1.0, stock is riskier than average.
- If beta < 1.0, stock is less risky than average.
- Most stocks have betas in the range of 0.5 to 1.5.

Beta and Risk Premium

- A risk free asset has a beta of zero
- When a risky asset is combined with a risk free asset, the resulting portfolio expected return is a

weighted sum of their expected returns and the portfolio beta is the weighted sum of their betas.

- Considers various portfolios comprised of an investment in stock A with a beta ( ) of 1.2 and expected return of 18%, and a Treasury bill with a 7% return. Compute the expected return and beta for different portfolios of stock A and a Treasury bill.

w_A	w_{rf}	$E(R_p)$	β_p
0.0	1.00		
0.25	0.75		
0.50	0.50		
0.75	0.25		
1.00	0.00		

- We can vary the amount invested in each type of asset and get an idea of the relation between portfolio expected return and portfolio beta.
- Reward-to-Risk-Ratio: $Reward\text{-}to\text{-}Risk\ Ratio = \frac{E(R_P) - R_f}{\beta_P}$

What if 2 assets (stocks, or risk free asset) have different

Reward-to-Risk-Ratios?

Fundamental Results:

- Portfolio expected returns and beta combinations lie on a straight line with slope (=rise/run) equal to: $Reward\text{-}to\text{-}Risk\ Ratio = \frac{E(R_P) - R_f}{\beta_P}$
- The reward-to-risk ratio is the expected return per "unit" of systematic risk, or, in other words, the ratio of the risk premium and the amount of systematic risk.
- Since systematic risk is all that matters in determining expected return, the reward-to-risk ratio must be the same for all assets and portfolios. If not, investors would only buy the assets (portfolios) that offer a higher reward-to-risk ratio.
- Because the reward-to-risk ratio is the same for all assets, it must hold for the risk free asset as well as for the market portfolio.

- Result:

Security Market Line

Security Market Line: The security market line is the line which gives the expected return-systematic risk (beta) combinations of assets in a well functioning, active financial market.

- In an active, competitive market in which only systematic risk affects expected return, the *reward-to-risk ratio must be the same for all assets in the market*.
- ***Market Portfolio***: Portfolio of all the assets in the market. This portfolio by definition has "average" systematic risk. That is, its beta is one. Since all assets must lie on the security market line, so must the market portfolio. Let $E(R_M)$ denote the expected return on the market portfolio.
- ***Expected Market risk premium:*** $E(R_M) - R_f$

Capital Asset Pricing Model (CAPM)

Since all assets have the same reward-to-risk ratio as well as the market portfolio we can prove:

$$\mathbf{E(R_i) = R_f + [E(R_M) - R_f]\beta_i}$$

The expected return on an asset depends on:

- ***time value of money***, as measure by
- ***reward per unit of systematic risk***, as measured by
- ***systematic risk***, as measured by

Example of using CAPM: Suppose an asset has 1.5 times the systematic risk as the market portfolio (average asset). If the risk-free rate as measured by the Treasury bill rate is 5% and the expected risk premium on the market portfolio is 8%, what is the stock's expected return according to the CAPM?

CAPM and Capital Budgeting: To determine the appropriate discount rate for use in evaluating an investment's value, we need a discount rate that reflects risk. CAPM measures risk.

- Determine an investment's beta
- Find the expected return using CAPM for that beta and use this interest rate as the appropriate discount rate.

Summary of Risk and Return

I. Total risk - the variance (or the standard deviation) of an asset‟s return.

II. Total return - the expected return + the unexpected return.

III. Systematic and unsystematic risks

IV. Systematic risks are unanticipated events that affect almost all assets to some degree.

V. Unsystematic risks are unanticipated events that affect single assets or small groups of assets.

VI. The effect of diversification - the elimination of unsystematic risk via the combination of assets into a portfolio.

VII. The systematic risk principle and beta - the reward for bearing risk depends *only* on its level of systematic risk.

VIII. The reward-to-risk ratio - the ratio of an asset‟s risk premium to its beta.

IX. The capital asset pricing model - $E(R_i) = R_f + [E(R_M) - R_f]\ \beta_i$

VALUATION OF SECURITIES

Valuation of bonds and shares

The valuation of any asset, real finance is equivalent to the current value of cash flows estimated from it.

Bond:

A bond is defined as a long-term debt tool that pays the bondholder a specified amount of periodic interest over a specified period of time. In financial area, a bond is an instrument of obligation of the bond issuer to the holders. It is a debt security, under which the issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay them interest and/or to recompense the principal at a later date, called the maturity date. Interest is generally payable at fixed intervals such as semi-annual, annual, and monthly. Sometimes, the bond is negotiable, i.e. the ownership of the instrument can be relocated in the secondary market. This means that once the transfer agents at the bank medallion stamp the bond, it is highly liquid on the second market.

It can be established that Bonds signify loans extended by investors to companies and/or the government. Bonds are issued by the debtor, and acquired by the lender. The legal contract underlying the loan is called a bond indenture.

Normally, bonds are issued by public establishments, credit institutions, companies and supranational institutions in the major markets. Simple process for issuing bonds is through countersigning. When a bond issue is underwritten, one or more securities firms or banks, forming a syndicate, buy the whole issue of bonds from the issuer and re-sell them to investors. The security firm takes the risk of being unable to sell on the issue to end investors. Primary issuance is organised by book runners who arrange the bond issue, have direct contact with depositors and act as consultants to the bond issuer in terms of timing and price of the bond issue. The book runner is listed first among all underwriters participating in the issuance in the tombstone ads commonly used to announce bonds to the public. The book-runners' willingness to underwrite must be discussed prior to any decision on the terms of the bond issue as there may be limited demand for the bonds.

On the contrary, government bonds are generally issued in an auction. In some cases both members of the public and banks may bid for bonds. In other cases, only market makers may bid for bonds. The overall rate of return on the bond depends on both the terms of the bond and the price paid. The terms of the bond, such as the coupon, are fixed in advance and the price is determined by the market.

Key Features of Bonds:

1. The par (or face or maturity) value is the amount repaid (excluding interest) by the borrower to the lender (bondholder) at the end of the bond's life.
2. The coupon rate decides the "interest" payments. Total annual amount = coupon rate x par value.
3. A bond's maturity is its remaining life, which drops over time. Original maturity is its maturity when it is issued. The firm promises to repay the par value at the end of the bond‟s maturity.
4. A sinking fund involves principle repayments (buying bonds) prior to the issue's maturity.
5. Exchangeable bonds can be converted into a pre-specified number of shares of stock. Characteristically, these are shares of the issuer's common stock.
6. The call provision permits the issuer to buy the bonds (repay the loan) prior to maturity for the call price. Calling may not be allowed in the first few years.

Bond valuation:

Valuation of a bond needs an estimate of predictable cash flows and a required rate of return specified by the investor for whom the bond is being valued. If it is being valued for the market, the markets expected rate of return is to be determined or estimated. The bond‟s fair value is the present value of the promised future coupon and principal payments. At the time of issue, the coupon rate is set such that the fair value of the bonds is very close to its par value. Afterwards, as market conditions change, the fair value may differ from the par value.

At the time of issue of the bond, the interest rate and other conditions of the bond would have been impacted by numerous factors, such as current market interest rates, the length of the term and the creditworthiness of the issuer. These factors are likely to change with time, so the market price of a bond will diverge after it is issued. The market price is expressed as a percentage of nominal value. Bonds are not necessarily issued at par (100% of face value, corresponding to a price of 100), but bond prices will move towards par as they approach maturity (if the market expects the maturity payment to be made in full and on time) as this is the price the issuer will pay to redeem the bond. This is termed as "Pull to Par". At other times, prices can be above par (bond is priced at greater than 100), which is called trading at a premium, or below par (bond is priced at less than 100), which is called trading at a discount.

The market price of a bond is the present value of all expected future interest and principal payments of the bond discounted at the bond's yield to maturity, or rate of return. That relationship is the definition of the redemption yield on the bond, which is expected to be close to the current market interest rate for other bonds with similar characteristics. The yield and price of a bond are inversely related so that when market interest rates rise, bond prices fall and vice versa. The market price of a bond may be cited including the accumulated interest since the last coupon date. The price including

accrued interest is known as the "full" or "dirty price". The price excluding accrued interest is known as the "flat" or "clean price".

The interest rate divided by the current price of the bond is termed as current yield. This is the nominal yield multiplied by the par value and divided by the price. There are other yield measures that exist such as the yield to first call, yield to worst, yield to first par call, yield to put, cash flow yield and yield to maturity.

The link between yield and term to maturity for otherwise identical bonds is called a yield curve. The yield curve is a graph plotting this relationship. Bond markets, dissimilar to stock or share markets, sometimes do not have a centralized exchange or trading system. Reasonably, in developed bond markets such as the U.S., Japan and Western Europe, bonds trade in decentralized, dealer-based over-the-counter markets. In such a market, market liquidity is offered by dealers and other market contributors committing risk capital to trading activity. In the bond market, when an investor buys or sells a bond, the counterparty to the trade is almost always a bank or securities firm which act as a dealer. In some cases, when a dealer buys a bond from an investor, the dealer carries the bond "in inventory", i.e. holds it for his own account. The dealer is then subject to risks of price fluctuation. In other cases, the dealer instantly resells the bond to another investor.

Bond markets can also diverge from stock markets in respect that in some markets, investors sometimes do not pay brokerage commissions to dealers with whom they buy or sell bonds. Rather, the dealers earn income through the spread, or difference, between the prices at which the dealer buys a bond from one investor the "bid" price and the price at which he or she sells the same bond to another investor the "ask" or "offer" price. The bid/offer spread signifies the total transaction cost associated with transferring a bond from one investor to another.

Share:

In financial markets, a share is described as a unit of account for different investments. It is also explained as the stock of a company, but is also used for collective investments such as mutual funds, limited partnerships, and real estate investment trusts. The phrase 'share' is delineated by section 2(46) of the Companies Act 1956 as "share means a share in the share capital of a company includes stock except where a distinction between stock and share is expressed or implied".

Companies issue shares which are accessible for sale to increase share capital. The owner of shares in the company is a shareholder (or stockholder) of the corporation. A share is an indivisible unit of capital, expressing the ownership affiliation between the company and the shareholder. The denominated value of a share is its face value, and the total of the face value of issued shares represent the capital of a company, which may not reflect the market value of those shares. The revenue generated from the ownership of shares is a dividend. The process of purchasing and selling shares often involves going through a stockbroker as a middle man.

Share valuation:

Shares valuation is done according to numerous principles in different markets, but a basic standard is that a share is worth price at which a transaction would be expected to occur to sell the shares. The liquidity of markets is a major consideration as to whether a share is able to be sold at any given time. An actual sale transaction of shares between buyer and seller is usually considered to provide the best prima facie market indicator as to the "true value" of shares at that specific time.

Shares are often promised as security for raising loans. When one company acquires majority of the shares of another company, it is required to value such shares. The survivors of deceased person who get some shares of company made by will. When shares are held by the associates mutually in a company and dissolution takes place, it is important to value the shares for proper distribution of partnership property among the partners. Shares of private companies are not listed on the stock exchange. If such shares are appraisable by the shareholders or if such shares are to be sold, the value of such shares will have to be determined. When shares are received as a gift, to determine the Gift Tax & Wealth Tax, the value of such shares will have to be ascertained.

Values of shares:

1. Face Value: A Company may divide its capital into shares of @10 or @50 or @100 etc. Company‟s share capital is presented as per Face Value of Shares. Face Value of Share = Share Capital / Total No of Share. This Face Value is printed on the share certificate. Share may be issued at less (or discount) or more (or premium) of face value.
2. Book Value: Book value is the value of an asset according to its balance sheet account balance. For assets, the value is based on the original cost of the asset less any devaluation, amortization or impairment costs made against the asset.
3. Cost Value: Cost value is represented as price on which the shares are purchased with purchase expenses such as brokerage, commission.
4. Market Value: This values is signified as price on which the shares are purchased or sold. This value may be more or less or equal than face value.
5. Capitalised Value:

$$\text{Capitalised Value of share} = \frac{\text{Capitalised Value of profit}}{\text{Total no. of shares}}$$

6. Fair Value: This value is the price of a share which agreed in an open and unrestricted market between well-informed and willing parties dealing at arm‟s length who are fully informed and are not under any compulsion to transact.

7. Yield Value: This value of a share is also called Capitalised value of Earning Capacity. Normal rate of return in the industry and actual or expected rate of return of the firm are taken into consideration to find out yield value of a share.

Need for Valuation:

1. When two or more companies merge
2. When absorption of a company takes place.
3. When some shareholders do not give their approval for reconstruction of the company, there shares are valued for the purpose of acquisition.
4. When shares are held by the associates jointly in a company and dissolution takes place, it becomes essential to value the shares for proper distribution of partnership property among the partners.
5. When a loan is advanced on the security of shares.
6. When shares of one type are converted in to shares of another type.
7. When some company is taken over by the government, compensation is paid to the shareholders of such company and in such circumstances, valuation of shares is made.
8. When a portion of shares is to be given by a member of proprietary company to another member, fair price of these shares has to be made by an auditor or accountant.

Methods of valuation:

1. Net Assets Value (NAV) Method: This method is called intrinsic value method or breakup value method (Naseem Ahmed, 2007). It aims to find out the possible value of share in at the time of liquidation of the company. It starts with calculation of market value of the company. Then amount pay off to debenture holders, preference shareholders, creditors and other liabilities are deducted from the realized amount of assets. The remaining amount is available for equity shareholders. Under this method, the net value of assets of the company are divided by the number of shares to arrive at the value of each share. For the determination of net value of assets, it is necessary to estimate the worth of the assets and liabilities. The goodwill as well as non-trading assets should also be included in total assets. The following points should be considered while valuing of shares according to this method:

- Goodwill must be properly valued
- The fictitious assets such as preliminary expenses, discount on issue of shares and debentures, accumulated losses etc. should be eliminated.
- The fixed assets should be taken at their realizable value.
- Provision for bad debts, depreciation etc. must be considered.
- All unrecorded assets and liabilities (if any) should be considered.
- Floating assets should be taken at market value.

- The external liabilities such as sundry creditors, bills payable, loan, debentures etc. should be deducted from the value of assets for the determination of net value.

The net value of assets, determined so has to be divided by number of equity shares for finding out the value of share. Thus the value per share can be determined by using the following formula:

Value Per Share= (Net Assets-Preference Share Capital)/Number Of Equity Shares

Net asset method is useful in case of amalgamation, merger, acquisition, or any other form of liquidation of a company. This method determines the rights of various types of shares in an efficient manner. Since all the assets and liabilities are values properly including ambiguous and intangibles, this method creates no problem for valuation of preference or equity share. However it is difficult to make proper valuation of good will and estimate net realisation value of various other assets of the company. Such estimates are likely to be influenced by personal factors of valuers. This method is suitable in case of companies likely to be liquidated in near future or future maintainable profits cannot be estimated properly or where valuation of shares by this method is required statutorily (Naseem Ahmed, 2007).

2. Yield-Basis Method: Yield is the effective rate of return on investments which is invested by the investors. It is always expressed in terms of percentage. Since the valuation of shares is made on the basis of Yield, it is termed as Yield-Basis Method.

Yield may be calculated as under:

$$\text{Yield} = \frac{\text{Normal profit}}{\text{Capital Employed}} \times 100$$

Under Yield-Basis method, valuation of shares is made on;

I. Profit Basis: Under this method, profit should be determined on the basis of past average profit; subsequently, capitalized value of profit is to be determined on the basis of normal rate of return, and, the same (capitalized value of profit) is divided by the number of shares in order to find out the value of each share.

Following procedure is adopted:

$$\text{Capitalised value of profit} = \frac{\text{Profit}}{\text{Normal rate of return}} \times 100$$

Capitalised value of profit

Value of each equity share =

$$\text{Value of each equity share} = \frac{\text{Profit}}{\text{Number of shares}}$$

$$\text{Or, Value of each equity share} = \frac{\text{Profit}}{\text{Normal rate of return X Number of equity shares}} \text{ X } 100$$

II. Dividend Basis: In this type of valuation, shares are valued on the basis of expected dividend and normal rate of return. The value per share is calculated through following formula:

Expected rate of dividend = (profit available for dividend/paid up equity share capital) X 100

Value per share = (Expected rate of dividend/normal rate of return) X 100

Valuation of shares may be made either (a) on the basis of total amount of dividend, or (b) on the basis of percentage or rate of dividend

3. Earning Capacity (Capitalisation) Method: In this valuation procedure, the value per share is calculated on the basis of disposable profit of the company. The disposable profit is found out by deducting reserves and taxes from net profit (Naseem Ahmed, 2007). The following steps are applied for the determination of value per share under earning capacity:

Step 1: To find out the profit available for dividend
Step 2: To find out the capitalized value
Capitalized Value = (Profit available for equity dividend/Normal rate of return) X 100
Step 3: To find out value per share

Value per share = Capitalized Value/Number of Shares
In this method, profit available for equity shareholders, as calculated under capitalization method, are capitalized on the basis of normal rate of return. Then the value of equity share is ascertained by dividing the capitalized profit by number of equity share as shown under (Naseem Ahmed, 2007):

$$\textbf{Value of Equity Share} = \frac{\textbf{Capitalised value of profits}}{\textbf{No. of equity shares}}$$

Appraisal of Earning Capacity: This method is suited only when maintainable profit and normal rate of return (NRR) can be ascertained clearly. It is possible when market information is easily available. However, while calculating NRR, risk factors must be taken into consideration (Naseem Ahmed, 2007).

4. Average (Fair Value) Method: In order to overcome the inadequacy of any single method of valuation of shares, Fair Value Method of shares is considered as the most appropriate process. It is simply an average of intrinsic value and yield value or earning capacity method. For valuing shares of investment companies for wealth tax purposes, Fair Value Method of shares is recognized by government. It is well suited to manufacturing and other companies. The fair value can be calculated by following formula (Naseem Ahmed, 2007):

$$\text{Fair value of share} = \frac{\text{Intrinsic Value} + \text{Yield Value}}{2}$$

$$\text{OR} = \frac{\text{Intrinsic Value} + \text{Capitalised Value / Earning Capacity}}{2}$$

To summarize, bonds and their alternatives such as loan notes, debentures and loan stock, are IOUs issued by governments and companies in order to increase finance. They are often called fixed income or fixed interest securities, to differentiate them from equities, in that they often make known returns for the investors (the bond holders) at regular intervals. These interest payments, paid as bond coupons, are fixed, unlike dividends paid on equities, which can be variable. Most corporate bonds are redeemable after a specified period of time. Valuation of share involves the use of financial and accounting data. It depends on valuer‟s judgement experience and knowledge.

Chapter

9

Capital Budgeting

INTRODUCTION

The word Capital refers to be the total investment of a company of firm in money, tangible and intangible assets. Whereas budgeting defined by the "**Rowland** and **William**" it may be said to be the art of building budgets. Budgets are a blue print of a plan and action expressed in quantities and manners.

The examples of capital expenditure:

1. Purchase of fixed assets such as land and building, plant and machinery, good will, etc.
2. The expenditure relating to addition, expansion, improvement and alteration to the fixed assets.
3. The replacement of fixed assets.
4. Research and development project.

Definitions

According to the definition of **Charles T. Hrongreen,** "capital budgeting is a long-term planning for making and financing proposed capital out lays.

According to the definition of **G.C. Philippatos,** "capital budgeting is concerned with the allocation of the firms source financial resources among the available opportunities. The consideration of investment opportunities involves the comparison of the expected future streams of earnings from a project with the immediate and subsequent streams of earning from a project, with the immediate and subsequent streams of expenditure".

According to the definition of **Richard and Green law,** "capital budgeting is acquiring inputs with long-term return".

According to the definition of **Lyrich,** "capital budgeting consists in planning development of available capital for the purpose of maximizing the long-term profitability of the concern".

It is clearly explained in the above definitions that a firm's scarce financial resources are utilizing the available opportunities. The overall objectives of the company from is to maximize the profits and minimize the expenditure of cost.

Need and Importance of Capital Budgeting

1. **Huge investments:** Capital budgeting requires huge investments of funds, but the available funds are limited, therefore the firm before investing projects, plan are control its capital expenditure.
2. **Long-term:** Capital expenditure is long-term in nature or permanent in nature. Therefore financial risks involved in the investment decision are more. If higher risks are involved, it needs careful planning of capital budgeting.
3. **Irreversible:** The capital investment decisions are irreversible, are not changed back. Once the decision is taken for purchasing a permanent asset, it is very difficult to dispose off those assets without involving huge losses.
4. **Long-term effect:** Capital budgeting not only reduces the cost but also increases the revenue in long-term and will bring significant changes in the profit of the company by avoiding over or more investment or under investment. Over investments leads to be unable to utilize assets or over utilization of fixed assets. Therefore before making the investment, it is required carefully planning and analysis of the project thoroughly.

CAPITAL BUDGETING PROCESS

Capital budgeting is a difficult process to the investment of available funds. The benefit will attained only in the near future but, the future is uncertain. However, the following steps followed for capital budgeting, then the process may be easier are.

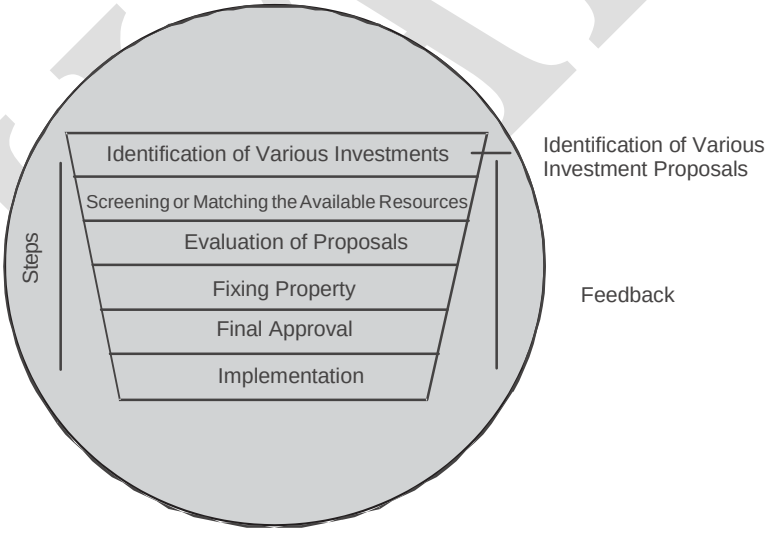


Fig. 9.1 *Capital Budgeting Process*

1. **Identification of various investments proposals:** The capital budgeting may have various investment proposals. The proposal for the investment opportunities may be defined from the top management or may be even from the lower rank. The heads of various department analyse the various investment decisions, and will select proposals submitted to the planning committee of competent authority.
2. **Screening or matching the proposals:** The planning committee will analyse the various proposals and screenings. The selected proposals are considered with the available resources of the concern. Here resources referred as the financial part of the proposal. This reduces the gap between the resources and the investment cost.
3. **Evaluation:** After screening, the proposals are evaluated with the help of various methods, such as pay back period proposal, net discovered present value method, accounting rate of return and risk analysis. Each method of evaluation used in detail in the later part of this chapter. The proposals are evaluated by.
   (a) Independent proposals
   (b) Contingent of dependent proposals
   (c) Partially exclusive proposals.

   Independent proposals are not compared with another proposals and the same may be accepted or rejected. Whereas higher proposals acceptance depends upon the other one or more proposals. For example, the expansion of plant machinery leads to constructing of new building, additional manpower etc. Mutually exclusive projects are those which competed with other proposals and to implement the proposals after considering the risk and return, market demand etc.
4. **Fixing property:** After the evolution, the planning committee will predict which proposals will give more profit or economic consideration. If the projects or proposals are not suitable for the concern's financial condition, the projects are rejected without considering other nature of the proposals.
5. **Final approval:** The planning committee approves the final proposals, with the help of the following:
   (a) Profitability
   (b) Economic constituents
   (c) Financial violability
   (d) Market conditions.

   The planning committee prepares the cost estimation and submits to the management.
6. **Implementing:** The competent autherity spends the money and implements the proposals. While implementing the proposals, assign responsibilities to the proposals, assign responsibilities for completing it, within the time allotted and reduce the cost for this purpose. The network techniques used such as PERT and CPM. It helps the management for monitoring and containing the implementation of the proposals.

7. **Performance review of feedback:** The final stage of capital budgeting is actual results compared with the standard results. The adverse or unfavourable results identified and removing the various difficulties of the project. This is helpful for the future of the proposals.

KINDS OF CAPITAL BUDGETING DECISIONS

The overall objective of capital budgeting is to maximize the profitability. If a firm concentrates return on investment, this objective can be achieved either by increasing the revenues or reducing the costs. The increasing revenues can be achieved by expansion or the size of operations by adding a new product line. Reducing costs mean representing obsolete return on assets.

METHODS OF CAPITAL BUDGETING OF EVALUATION

By matching the available resources and projects it can be invested. The funds available are always living funds. There are many considerations taken for investment decision process such as environment and economic conditions.

The methods of evaluations are classified as follows:

(A) Traditional methods (or Non-discount methods)

(i) Pay-back Period Methods

(ii) Post Pay-back Methods

(iii) Accounts Rate of Return

(B) Modern methods (or Discount methods)

(i) Net Present Value Method

(ii) Internal Rate of Return Method

(iii) Profitability Index Method

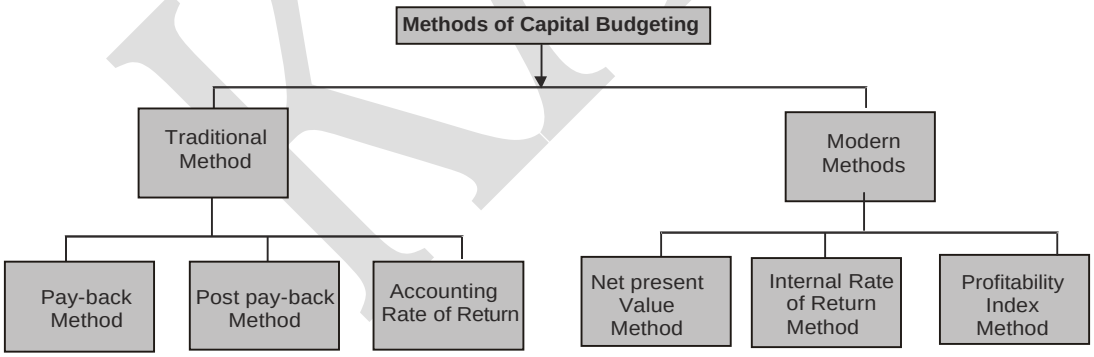


***Fig. 9.2** Capital Budgeting Methods*

Pay-back Period

Pay-back period is the time required to recover the initial investment in a project.

(It is one of the non-discounted cash flow methods of capital budgeting).

$$\text{Pay-back period} = \frac{\text{Initial investment}}{\text{Annual cash inflows}}$$

Merits of Pay-back method

The following are the important merits of the pay-back method:

1. It is easy to calculate and simple to understand.
2. Pay-back method provides further improvement over the accounting rate return.
3. Pay-back method reduces the possibility of loss on account of obsolescence.

Demerits

1. It ignores the time value of money.
2. It ignores all cash inflows after the pay-back period.
3. It is one of the misleading evaluations of capital budgeting.

Accept /Reject criteria

If the actual pay-back period is less than the predetermined pay-back period, the project would be accepted. If not, it would be rejected.

Exercise 1

Project cost is Rs. 30,000 and the cash inflows are Rs. 10,000, the life of the project is 5 years. Calculate the pay-back period.

Solution

$$= \frac{\text{Rs. } 30{,}000}{\text{Rs. } 10{,}000} = 3 \text{ Years}$$

The annual cash inflow is calculated by considering the amount of net income on the amount of depreciation project (Asset) before taxation but after taxation. The income precision earned is expressed as a percentage of initial investment, is called unadjusted rate of return. The above problem will be calculated as below:

$$\text{Unadjusted rate of return} = \frac{\text{Annual Return}}{\text{Investment}} \times 100$$

$$= \frac{\text{Rs. } 10{,}000}{\text{Rs. } 30{,}000} \times 100$$

$$= 33.33\%$$

Exercise 2

A project costs Rs. 20,00,000 and yields annually a profit of Rs. 3,00,000 after depreciation @ 12½% but before tax at 50%. Calculate the pay-back period.

Profit after depreciation	3,00,000
Tax 50%	1,50,000
	1,50,000
Add depreciation	
20,00,000 $12\frac{1}{2}\%$	2,50,000
Cash in flow	4,00,000

Solution

$$\text{Pay-back period} = \frac{\text{Investment}}{\text{Cash flow}}$$

$$= \frac{20,00,000}{4,00,000} = 5 \text{ years.}$$

Uneven Cash Inflows

Normally the projects are not having uniform cash inflows. In those cases the pay-back period is calculated, cumulative cash inflows will be calculated and then interpreted.

Exercise 3

Certain projects require an initial cash outflow of Rs. 25,000. The cash inflows for 6 years are Rs. 5,000, Rs. 8,000, Rs. 10,000, Rs. 12,000, Rs. 7,000 and Rs. 3,000.

Solution

Year	Cash Inflows (Rs.)	Cumulative Cash Inflows (Rs.)
1	5,000	5,000
2	8,000	13,000
3	10,000	23,000
4	12,000	35,000
5	7,000	42,000
6	3,000	45,000

The above calculation shows that in 3 years Rs. 23,000 has been recovered Rs. 2,000, is balance out of cash outflow. In the 4th year the cash inflow is Rs. 12,000. It means the pay-back period is three to four years, calculated as follows

$$\text{Pay-back period} = 3 \text{ years} + 2000/12000 \times 12 \text{ months}$$

$$= 3 \text{ years } 2 \text{ months.}$$

Post Pay-back Profitability Method

One of the major limitations of pay-back period method is that it does not consider the cash inflows earned after pay-back period and if the real profitability of the project cannot be assessed. To improve over this method, it can be made by considering the receivable after the pay-back period. These returns are called post pay-back profits.

Exercise 4

From the following particulars, compute:

1. Payback period.
2. Post pay-back profitability and post pay-back profitability index.

(a)	Cash outflow	Rs. 1,00,000
	Annual cash inflow (After tax before depreciation)	Rs. 25,000
	Estimate Life	6 years
(b)	Cash outflow	Rs. 1,00,000
	Annual cash inflow (After tax depreciation)	
	First five years	Rs. 20,000
	Next five years	Rs. 8,000
	Estimated life	10 Years
	Salvage value	Rs. 16,000

Solution

(a) (i) Pay-back period

$$= \frac{\text{Initial investment}}{\text{Annual cash inflows}}$$

$$= \frac{1,00,000}{25,000} = 4 \text{ Years}$$

(ii) Post pay-back profitability

=Cash inflow (Estimated life – Pay-back period)

=25,000 (6 – 4)

=Rs. 50,000

(iii) Post pay-back profitability index

$$= \frac{50,000}{1,00,000} \times 100 = 50\%$$

(b) Cash inflows are equal, therefore pay back period is calculated as follows:

(i)

Year	Cash Inflows (Rs.)	Cumulative Cash Inflows (Rs.)
1	20,000	20,000
2	20,000	40,000
3	20,000	60,000
4	20,000	80,000

Contd....

5	20,000	1,00,000
6	8,000	1,08,000
7	8,000	1,16,000
8	8,000	1,24,000
9	8,000	1,32,000
10	8,000	1,40,000

(ii) Post pay-back profitability.

$$= \text{Cash inflow (estimated life – pay-back period)}$$
$$= 8{,}000\ (10–5)$$
$$= 8000 \times 5 = 40{,}000$$

(iii) Post pay-back profitability index

$$= \frac{40{,}000}{1{,}00{,}000} \times 100 = 40\%$$

Accounting Rate of Return or Average Rate of Return

Average rate of return means the average rate of return or profit taken for considering the project evaluation. This method is one of the traditional methods for evaluating the project proposals:

Merits

1. It is easy to calculate and simple to understand.
2. It is based on the accounting information rather than cash inflow.
3. It is not based on the time value of money.
4. It considers the total benefits associated with the project.

Demerits

1. It ignores the time value of money.
2. It ignores the reinvestment potential of a project.
3. Different methods are used for accounting profit. So, it leads to some difficulties in the calculation of the project.

Accept/Reject criteria

If the actual accounting rate of return is more than the predetermined required rate of return, the project would be accepted. If not it would be rejected.

Exercise 5

A company has two alternative proposals. The details are as follows:

	Proposal I	Proposal II
	Automatic Machine	Ordinary Machine
Cost of the machine	Rs. 2,20,000	Rs. 60,000
Estimated life	5½ years	8 years
Estimated sales p.a.	Rs. 1,50,000	Rs. 1,50,000
Costs : Material	50,000	50,000
Labour	12,000	60,000
Variable Overheads	24,000	20,000

Compute the profitability of the proposals under the return on investment method.

(M.Com., Madras and Bharathidasan)

Solution

Profitability Statement

	Automatic Machine	Ordinary Machine
Cost of the machine	Rs. 2,20,000	Rs. 60,000
Life of the machine	5½ years	8 years
	Rs.	**Rs.**
Estimated Sales	(A) 1,50,000	1,50,000
Less : Cost : Material	50,000	50,000
Labour	12,000	60,000
Variable overheads	24,000	20,000
Depreciation (1)	40,000	7,000
Total Cost	(B) 1,26,000	1,37,000
Profit (A) – (B)	24,000	12,500

Working:

(1) Depreciation = Cost ÷ Life

Automatic machine = 2,20,000 ÷ 5½ = 40,000

Ordinary machine = 60,000 ÷ 8 = 7,500

$$\text{Return on investment} = \frac{\text{Average profit}}{\text{Original investment}} \times 100$$

$$= \frac{24,000}{2,20,000} \times 100 \qquad \frac{12,500}{60,000} \times 100$$

10.9% 20.8%

Automatic machine is more profitable than the ordinary machine.

Net Present Value

Net present value method is one of the modern methods for evaluating the project proposals. In this method cash inflows are considered with the time value of the money. Net present value describes as the summation of the present value of cash inflow and present value of cash outflow. Net present value is the difference between the total present value of future cash inflows and the total present value of future cash outflows.

Merits

1. It recognizes the time value of money.
2. It considers the total benefits arising out of the proposal.
3. It is the best method for the selection of mutually exclusive projects.
4. It helps to achieve the maximization of shareholders' wealth.

Demerits

1. It is difficult to understand and calculate.
2. It needs the discount factors for calculation of present values.
3. It is not suitable for the projects having different effective lives.

Accept/Reject criteria

If the present value of cash inflows is more than the present value of cash outflows, it would be accepted. If not, it would be rejected.

Exercise 6

From the following information, calculate the net present value of the two project and suggest which of the two projects should be accepted a discount rate of the two.

	Project X	Project Y
Initial Investment	Rs. 20,000	Rs. 30,000
Estimated Life	5 years	5 years
Scrap Value	Rs. 1,000	Rs. 2,000

The profits before depreciation and after taxation (cash flows) are as follows:

	Year 1	Year 2	Year 3	Year 4	Year 5
	Rs.	Rs.	Rs.	Rs.	Rs.
Project x	5,000	10,000	10,000	3,000	2,000
Project y	20,000	10,000	5,000	3,000	2,000

Note : The following are the present value factors @ 10% p.a.

Year	1	2	3	4	5	6
Factor	0.909	0.826	0.751	0.683	0.621	0.564

(MBA, Madurai-Kamaraj University, May 2005)

Solution

Year	Cash Inflows		Present Value of Rs. 1 @ 10%	Present Value of Net Cash Inflow	
	Project X Rs.	Project Y Rs.		Project X Rs.	Project Y Rs.
1	5,000	20,000	0.909	4,545	18,180
2	10,000	10,000	0.826	8,260	8,260
3	10,000	5,000	0.751	7,510	3,755
4	3,000	3,000	0.683	2,049	2,049
5	2,000	2,000	0.621	1,242	1,242
Scrap Value	1,000	2,000	0.621	621	1,245
Total present value				24,227	34,728
Initial investments				20,000	30,000
Net present value				4,227	4,728

Project Y should be selected as net present value of project Y is higher.

Exercise 7

The following are the cash inflows and outflows of a certain project.

Year	Outflows	Inflows
0	1,75,000	-
1	5,50,000	35,000
2		45,000
3		65,000
4		85,000
5		50,000

The salvage value at the end of 5 years is Rs. 50,000. Taking the cutoff rate as 10%, calculate net present value.

Year	1	2	3	4	5
P.V.	0.909	0.826	0.751	0.683	0.621

Solution

Year	Cash Inflows Rs.	Present Value Factor @ 10%	Present Value of Cash Inflows
1	35,000	0.909	31,815
2	45,000	0.826	37,170

Contd....

3	65000	0.751	48815
4	85000	0.683	58055
5	50000	0.621	31050
5(Salvage)	50000	0.621	31050
		Total present value of cash inflows	237955

Less : Total present value of outflows

Cash outflow at the beginning	1,75,000
Cash outflow at the end of first Year 50000×0.909	45,450
Total value of outflows	2,20,450
Net Present Value	17,505

If the cash inflows are not given in that cases the calculation of cash inflows are Net profit after tax+Depreciation. In this type of situation first find out the Net profit after depreciation and deducting the tax and then add the deprecation. It gives the cash inflow.

Exercise 8 From the following information you can learn after tex and depreciation concept.

Initial Outlay	**Rs. 1,00,000**
Estimated life	5 Years
Scrap Value	Rs. 10,000
Profit after tax :	
End of year 1	Rs. 6,000
2	Rs. 14,000
3	Rs. 24,000
4	16,000
5	Nil

Solution Depreciation has been calculated under straight line method. The cost of capital may be taken at 10%. P.a. is given below.

Year	1	2	3	4	5
PV factor @ 10%	0.909	0.826	0.751	0.683	0.621

$$\text{Depreciation} = \frac{\text{Initial cash outflow – scrap value}}{\text{Estimated Life of the project}}$$

$$= \frac{1,00,000 - 10,000}{5}$$

$$= \frac{90,000}{5} = \text{Rs.}18,000$$

Year	Profit after Tax	Depreciation	Cash Inflow
1	6,000	18,000	24,000
2	14,000	18,000	32,000
3	24,000	18,000	42,000
4	16,000	18,000	34,000
5	Nil	18,000	18,000

Net Present Value

Year	Cash Inflow	Discount factor @ 10%	Present value (Rs.)
1	24,000	0.909	21,816
2	32,000	0.826	26,432
3	42,000	0.751	31,542
4	34,000	0.683	23,222
5	18,000	0.621	11,178

Total present value of cash inflows	1,14,190
Less : Initial cash investment	1,00,000
Net present value	1,41,90

Internal Rate of Return

Internal rate of return is time adjusted technique and covers the disadvantages of the traditional techniques. In other words it is a rate at which discount cash flows to zero. It is expected by the following ratio:

$$\frac{\text{Cash inflow}}{\text{Investment initial}}$$

Steps to be followed:

Step1. find out factor

Factor is calculated as follows:

$$F = \frac{\text{Cash outlay (or) initial investment}}{\text{Cash inflow}}$$

Step 2. Find out positive net present value

Step 3. Find out negative net present value

Step 4. Find out formula net present value

Formula

$$\text{IRR} = \text{Base factor} + \frac{\text{Positive net present value}}{\text{Difference in positive and Negative net present value}} \times \text{DP}$$

Base factor = Positive discount rate

DP = Difference in percentage

Merits

1. It consider the time value of money.
2. It takes into account the total cash inflow and outflow.
3. It does not use the concept of the required rate of return.
4. It gives the approximate/nearest rate of return.

Demerits

1. It involves complicated computational method.
2. It produces multiple rates which may be confusing for taking decisions.
3. It is assume that all intermediate cash flows are reinvested at the internal rate of return.

Accept/ Reject criteria

If the present value of the sum total of the compounded reinvested cash flows is greater than the present value of the outflows, the proposed project is accepted. If not it would be rejected.

Exercise 9

A company has to select one of the following two projects:

	Project A	Project B
Cost	Rs.22,000	20,000
Cash inflows:		
Year 1	12,000	2,000
Year 2	4,000	2,000
Year 3	2,000	4,000
Year 4	10,000	20,000

Using the Internal Rate of Return method suggest which is Preferable.

Solution

$$F = \frac{\text{Cash outlay}}{\text{Cash inflow}}$$

Project A

$$\text{Cash Inflow} = \frac{\text{Total cash inflow}}{\text{No. of years}}$$

$$= \frac{28{,}000}{4} = 7000$$

$$= \frac{22000}{7000} = 3.14$$

The factor thus calculated will be located in table II below. This would give the estimated rate of return to be applied discounting the cash for the internal rate of returns. In this of project A the rate comes to 10% while in case of project B it comes to15%.

Project A

Year	Cash Inflows Rs.	Discounting Factor at 10%	Present Value Rs.
1	12000	0.909	10908
2	4000	0.826	3304
3	2000	0.751	1502
4	10000	0.683	6830
			22544
Less: Initial Investment.			22000
Net Present Value			544

The present value at 10% comes to Rs. 22,544. The initial investment is Rs. 22,000. Interest rate of return may be taken approximately at 10%.

In the case more exactness is required another trial which is slightly higher than 10%(since at this rate the present value is more than initial investment) may be taken. Taking a rate of 12% the following results would emerge.

Year	Cash Inflows Rs.	Discounting Factor at 12.6%	Present Value Rs.
1	12,000	0.893	10,716
2	4,000	0.794	3,188
3	2,000	0.712	1,424
4	10,000	0.636	6,380
			21,688
Less:	Initial Investment Value		22,000
	Net Present Value		(–)312

$$\text{IRR} = \text{Base factor} + \frac{\text{Positive net present value}}{\text{Difference in positive and Negative net present value}} \times \text{DP}$$

Base factor= 10%

DP = 2%

$$= 10\% + \frac{544}{544 - (-312)} \times 2\%$$

$$= 10\% + \frac{544}{856} \times 2$$

$$= 10+1.27$$

$$= 11.27\%$$

Project B

Year	Cash Inflows Rs.	Discount Factor at 15%	Present value Rs.
1	2,000	0.909#	1,818
2	2,000	0.826	1,652
3	4,000	0.751	3,004
4	20,000	0.683	13,660
		Total present value	20,134
Less:		Initial investment	20,000
		Net present value	134

$$\text{IRR} = 10\% \frac{134}{134-(2676)} \times 5\%$$

$$= 10\% + 0.24\% \qquad \text{IRR} = 10.24\%$$

Thus, internal rate of return in project 'A' is higher as compared to project 'B'. Therefore project 'A' is preferable.

Exercise 10

A project costs Rs. 16,000 and is expected to generate cash inflows of Rs. 4,000 each 5 years. Calculate the Interest Rate of Return.

Solution

$$F = \frac{16,000}{4,000} = 4$$

Facts may lays between 6% to 8%

4.221 for 6%

3.993 for 8%

$4000 \times 4.21 =$	16,840
$4000 \times 3.99 =$	15,960
6% present value	16,840
Less: Investment	16,000
Net present value	840

8% present value	15,960
Less: Investment	16,000
	–40

$$IRR = 6\% + \frac{840}{840 - (-40)} \times 2\%$$

$$= 6\% + 1.91\%$$

$$= 7.91\%.$$

Excess Present Value Index

Excess present value is calculated on basis of net present value. It gives the results in percentage.

Exercise 11

The initial of an equipment is Rs. 10,000. Cash inflow for 5 years are estimated to be Rs. 3,500 per year. The management is desired minimum rate of excess present value index.

Solution

Present value of Rs. 1 received annually for 5 years can be had form the annuity table.

Present value of 3,500 received annually for 5 years.

$$\text{Excess present value index} = \frac{\text{Total present value of cash inflows}}{\text{Total present value of cash outflows}}$$

$$= \frac{11,732}{10,000} \times 100$$

$$= 117,32\%$$

Capital Rationing

In the rationing the company has only limited investment the project are selected according to the profitability. The project has selected the combination of proposal that will yield the greatest portability.

Exercise 12 Let us assume that a firm has only Rs. 20 lakhs to invest and funds cannot be provided. The various proposals along with the cost and profitability index are as follows.

Proposal	Pool of the project	Profitability Index
1	6,00,000	1.46
2	2,00,000	.098
3	10,00,000	2.31
4	4,00,000	1.32
5	3,00,000	1.25

Solution

In this example all proposals expect number 2 give profitability exceeding one and are profitable investments. The total outlay required to be invested in all other (profitable) project is Rs. 25,00,000(1+2+3+4+5) but total funds available with the firm are Rs. 20 lakhs and hence the firm has to do capital combination of project within a total which has the lowest profitability index along with the profitable proposals cannot be taken.

RISK AND UNCERTAINLY IN CAPITAL BUDGETING

Capital budgeting requires the projection of cash inflow and outflow of the future. The future in always uncertain, estimate of demand, production, selling price, cost etc., cannot be exact.

For example: The product at any time it become obsolete therefore, the future in unexpected. The following methods for considering the accounting of risk in capital budgeting. Various evaluation methods are used for risk and uncertainty in capital budgeting are as follows:

(i) Risk-adjusted cut off rate (or method of varying discount rate)
(ii) Certainly equivalent method.
(iii) Sensitivity technique.
(iv) Probability technique
(v) Standard deviation method.
(vi) Co-efficient of variation method.
(vii) Decision tree analysis.

(i) Risk-adjusted cutoff rate (or Method of varying)

This is one of the simplest method while calculating the risk in capital budgeting increase cut of rate or discount factor by certain percentage an account of risk.

Exercise 13 The Ramakrishna Ltd., in considering the purchase of a new investment. Two alternative investments are available (X and Y) each costing Rs. 150000. Cash inflows are expected to be as follows:

Cash Inflows

Year	Investment X Rs.	Investment Y Rs.
1	60,000	65,000
2	45,000	55,000
3	35,000	40,000
4	30,000	40,000

The company has a target return on capital of 10%. Risk premium rate are 2% and 8% respectively for investment X and Y. Which investment should be preferred?

Solution

The profitability of the two investments can be compared on the basis of net present values cash inflows adjusted for risk premium rates as follows:

Investment X				Investment Y		
Year	Discount Factor10% + 2% = 12%	Cash Inflow Rs.	Present Value Rs.	Discount Factor 10% + 8%=18%	Cash Inflow Rs.	Present Values
1	0.893	60,000	53,580	0.847	85,000	71,995
2	0.797	45,000	35,865	0.718	55,000	39,490
3	0.712	35,000	24,920	0.609	40,000	24,360
4	0.635	30,000	19,050	0.516	40,000	20,640
			1,33,415			1,56,485

Investment X

Net present value = 133415 – 150000

= – Rs. 16585

Investment Y

Net present value = 156485 – 150000

= Rs. 6485

As even at a higher discount rate investment Y gives a higher net present value, investment Y should be preferred.

(ii) Certainly equivalent method

It is also another simplest method for calculating risk in capital budgeting info reduceds expected cash inflows by certain amounts it can be employed by multiplying the expected cash inflows by certainly equivalent co-efficient in order the uncertain cash inflow to certain cash inflows.

Exercise 14

There are two projects A and B. Each involves an investment of Rs. 50,000. The expected cash inflows and the certainly co-efficient are as under:

Year	Project A		Project B	
	Cash inflows	Certainly co-efficient	Cash inflows	Certainly Co-efficient
1	35,000	.8	25,000	.9
2	30,000	.7	35,000	.8
3	20,000	.9	20,000	.7

Risk-free cutoff rate is 10%. Suggest which of the two projects. Should be preferred.

Solution

Calculations of cash Inflows with certainly:

Year	Project A			Project B		
	Cash Inflow	Certainly Co-efficient	Certain Cash Inflow	Cash Inflow	Certainly Co-efficient	Certain Cash Inflow
1	35,000	.8	28,000	25,000	.9	22,500
2	30,000	.7	21,000	35,000	.8	28,000
3	20,000	.9	18,000	20,000	.7	14,000

Calculation of present values of cash inflows:

Year	Project A		Project B		
	Discount Factor @ 10%	Cash Inflows	Present Values	Cash Inflows	Present Value
1	0.909	28,000	25,452	22,500	20,453
2	0.826	21,000	17,346	28,000	23,128
3	0.751	18,000	13,518	14,000	10,514
Total			56,316		54,095

	Project A	Project B
Net present value	= Rs. 56,316 – 50,000	54,095 – 50,000
	= Rs. 6,316	Rs. 4,095

As the net present value of project A in more than that of project B. Project A should be preferred:

(iii) Sensitivity technique

When cash inflows are sensitive under different circumstances more than one forecast of the future cash inflows may be made. These inflows may be regarded on 'Optimistic', 'most likely' and 'pessimistic'. Further cash inflows may be discounted to find out the net present values under these three different situations. If the net present values under the three situations differ widely it implies that there is a great risk in the project and the investor's is decision to accept or reject a project will depend upon his risk bearing activities.

Exercise 15

Mr. Selva is considering two mutually exclusive project 'X' and 'Y'. You are required to advise him about the acceptability of the projects from the following information.

	Project X Rs.	Projects Y Rs.
Cost of the investment	1,0,0000	1,00,000
Forecast cash inflows per annum for 5 years		
Optimistic	60,000	55,000
Most likely	35,000	30,000
Pessimistic	20,000	20,000

(The cut-off rate may be assumed to be 15%).

Solution

Calculation of net present value of cash inflows at a discount rate of 15%.

(Annuity of Re. 1 for 5 years).

For Project X

Event	Annual cash Inflow Rs.	Discount factor @ 15 %	Present value Rs.	Net Present value Rs.
Optimistic	60,000	3.3522	2,01,132	1,01,132
Most likely	35,000	3.3522	1,17,327	17,327
Pessimistic	20,000	3.3522	67,105	(32,895)

For Project Y

Event	Annual cash Inflow Rs.	Discount factor @ 15 %	Present value Rs.	Net Present value Rs.
Optimistic	55,000	3.3522	1,84,371	84,371
Most likely	30,000	3.3522	1,00,566	566
Pessimistic	20,000	3.3522	67,105	(32,895)

The net present values on calculated above indicate that project Y is more risky as compared to project X. But at the same time during favourable condition, it is more profitable also. The acceptability of the project will depend upon Mr. Selva's attitude towards risk. If he could afford to take higher risk, project Y may be more profitable.

(iv) Probability technique

Probability technique refers to the each event of future happenings are assigned with relative frequency probability. Probability means the likelihood of future event. The cash inflows of the future years further discounted with the probability. The higher present value may be accepted.

Exercise 16

Two mutually exclusive investment proposals are being considered. The following information in available.

	Project A (Rs.)	Project B (Rs.)
Cost	10,000	10,000

Cash inflows Year	Rs.	Probability	Rs.	Probability
1	10,000	.2	12,000	.2
2	18,000	.6	16,000	.6
3	8,000	.2	14,000	.2

Assuming cost of capital at (or) advise the selection of the project:

Solution

Calculation of net project values of the two projects.

Project A

Year	P.V. Factor @ 10 %	Cash Inflow	Probability	Monetary Value	Present Value Rs.
1	0.909	10,000	.2	2,000	1,818
2	0.826	18,000	.6	10,800	8,921
3	0.751	8,000	.2	1,600	1,202
		Total Present value			11,941
		Cost of Investment			10,000
		Net present value			1,941

Project B

Year	P.V. Factor @ 10 %	Cash Inflow	Probability	Monetary Value	Present Value Rs.
1	0.909	12,000	.2	2,400	2,182
2	0.826	14,000	.6	8,400	6,938
3	0.751	14,000	.2	2,800	2,103
		Total present value			11,223
		Cost of investment			10,000
		Net present value			1,223

As net present value of project A is more than that of project B after taking into consideration the probabilities of cash inflows project A is more profitable one.

(v) Standard deviation method

Two Projects have the same cash outflow and their net values are also the same, standard durations of the expected cash inflows of the two Projects may be calculated to measure the comparative and risk of the Projects. The project having a higher standard deviation in said to be more risky as compared to the other.

Exercise 17

From the following information, ascertain which project should be selected on the basis of standard deviation.

Project X		Project Y	
Cash inflow	Probability	Cash inflow	Probability
Rs.		Rs.	
3,200	.2	32,000	.1
5,500	.3	5,500	.4
7,400	.3	7,400	.4
8,900	.2	8,900	.1

Solution

Project X

Cash inflow	Deviation from Mean (d)	Square Deviations d^2	Probability	Weighted Deviations (td^2)
1	2	3	4	5
3,200	(–) 6,250	9,30,25,000	.2	18,60,500
5,500	(–) 750	56,2,500	.3	1,68,750
7,400	(+) 1,150	13,22,500	.3	3,96,750
8,900	(+) 2,650	70,22,500	.2	14,04,500

n= 1 Σfd^2 = 38,30,500

$$\text{Standard Deviation } (6) = \sqrt{\frac{\Sigma fd^2}{n}}$$

$$= \sqrt{\frac{3830500}{1}}$$

$$= 1957.2$$

Project Y

1	2	3	4	5
3,200	(–) 3,050	9,30,25,000	.1	9,30,250
5,500	(–) 750	5,62,500	.4	2,25,000
7,400	(+) 1,150	13,22,500	.4	5,29,000
8,900	(+) 2,650	70,22,500	.1	7,02,250

n= 1 Σfd^2 = 3830500

$$\text{Standard deviation}(6) = \sqrt{\frac{\Sigma fd^2}{n}}$$

$$= \sqrt{\frac{2386500}{1}}$$

$$= 1544.8$$

As the standard deviation of project X is more then that of project Y, A is more risky.

(vi) Co-efficient of variation method

Co-efficient of variation is a relative measure of dispersion. It the projects here the same cost but different net present values, relatives measure, i.e., Co-efficient of variation should be risk induced. It can be calculated as:

$$\text{Co-efficient of variation} = \frac{\text{Standard deviation}}{\text{mean}} \times 100$$

Exercise 18

Using figure of previous example compute co-efficient of variation and suggest which proposal should be accepted:

Solution

$$\textbf{For project X} = \frac{1957.2}{6250} \times 100$$

$$= 31.31\%$$

$$\textbf{For project Y} = \frac{1544.8}{6250} \times 100$$

$$= 29.52\%$$

As the co-efficient of variation of project 'X' in more then that 'Y' project X in more risk. Hence, project Y should be selected.

(vii) Decision tree analysis

In the modern business world, putting the investments are become more complex and taking decisions in the risky situations. So, the decision tree analysis helpful for taking risky and complex decisions, because it consider all the possible event's and each possible events are assigned with the probability.

Construction of Decision Tree

1. Defined the problem
2. Evaluate the different alternatives
3. Indicating the decision points
4. Assign the probabilities of the monetary values
5. Analysis the alternatives.

Accept/Reject criteria

If the net present values are in positive the project may be accepted otherwise it is rejected.

Exercise 19

Mr. Kumar in considering an investment proposal of Rs.40,000. The expected returns during the left of the investment are as under:

Year I

Event	Cash Inflow	Probability
(i)	16,000	.3
(ii)	24,000	.5
(iii)	20,000	.2

Year II

Cash inflows in **year1** are:

	16,000		24,000		20,000	
	Cash Inflows (Rs.)	Prob	Cash Inflows (Rs.)	Prob	Cash Inflows (Rs.)	Prob
(i)	30,000	.2	40,000	.1	5,000	.2
(ii)	40,000	.6	60,000	.8	8,000	.5
(iii)	50,000	.2	80,000	.1	12,000	.3

using 10% as the cost of capital, advise about the acceptability of the proposal:

Solution

Calculation of net present values of cash inflows

Year	Year I Prob. Cash Inflow		Year II Prob. Cash Inflow	Net Present Value of Inflow	Joint Prob.	Expected Net Present value
Cash outflow Rs.40,000	.3	1,6000	2	30,000	(–) 676	.06	(–) 40.56
			.6	40,000	7,584	.18	1,365.12
			.2	50,000	15,844	.06	950.64
	.5	24,000	.1	20,000	14,856	.04	742.80
			.8	60,000	31,376	.10	2,550.40
			.1	80,000	47,896	.06	2,394.80
	.2	20,000	.2	50,000	19,480	.04	779.20
			.5	80,000	44,260	.10	4,426.00
			.3	1,20,000	77,300	.06	4,638.00
						1.00	27,806.40

The main idea behind the time value of money is that a dollar today is worth more than a dollar in the future because _____.
You invest a certain amount of money today. The process of determining how much money that investment will produce in the future is called _____.
A certain investment that costs $10,000 today promises to pay you $10,500 in five years. This investment _____.
The present value of $100 to be received 10 years from today, assuming an opportunity cost of 9 percent, is approximately _____.
The future value of $200 received today and deposited at 8 percent for three years is approximately _____.
The amount of money that would have to be invested today at a given interest rate over a specified period in order to equal a future amount is called _____.
The present value of $200 to be received 10 years from today, assuming an opportunity cost of 10 percent, is approximately _____.
The future value of a dollar _____ as the interest rate increases and _____ the longer the money remains invested.
The annual rate of return is referred to as the _____.
Which of the following is TRUE of annuities?
An annuity with an infinite life is called a(n) _____.
A(n) _____ is an annuity with an infinite life making continual annual payments.
In comparing an ordinary annuity and an annuity due, which of the following is TRUE?
The future value of an ordinary annuity of $2,000 each year for 10 years, deposited at 12 percent, is _____.
The present value of a perpetual income stream increases when the discount rate _____.
You receive $1,000 in 1 year, $1,200 in 2 years, and $1,300 in 3 years. The present value today of these future receipts is _____ if the opportunity cost is 7 percent.
A $60,000 outlay for a new machine with a usable life of 15 years is called _____.

_____ projects do not compete with each other; the acceptance of one _____ the others from consideration.
_____ projects have the same function; the acceptance of one _____ the others from consideration.
A firm with limited dollars available for capital expenditures is subject to _____.
Projects that compete with one another, so that the acceptance of one eliminates the others from further consideration are called _____.
A conventional cash flow pattern associated with capital investment projects consists of an initial _____.
A nonconventional cash flow pattern associated with capital investment projects consists of an initial _____.
Which of the following capital budgeting techniques ignores the time value of money?
The _____ measures the amount of time it takes a firm to recover its initial investment.
Payback is considered a flawed capital budgeting because it _____.
Which of the following is a disadvantage of payback period approach?
The return that must be earned on a project in order to leave the firm's value unchanged is _____.
Thinking in terms of the goal of wealth maximization, a project breaks even for shareholders, meaning that it neither creates nor destroys value, if _____.
A firm can accept a project with a net present value of zero because _____.
The _____ is the discount rate that equates the present value of the cash inflows with the initial investment.
The _____ is the compound annual rate of return that a firm will earn if it invests in the project and receives the given cash inflows.
When the amount earned on a deposit has become part of the principal at the end of a specified time period the concept is called
The amount of money that would have to be invested today at a given interest rate over a specified period in order to equal a future amount is called
The future value of a dollar _____ as the interest rate increases and _____ the farther in the future an initial deposit is to be received.

If the present value of a perpetual income stream is increasing, the discount rate must be
The time value concept/calculation used in amortizing a loan is
_____ is a series of equal annual cash flows.
A conventional cash flow pattern associated with capital investment projects consists of an initial
Projects that compete with one another, so that the acceptance of one eliminates the others from further consideration are called
The evaluation of capital expenditure proposals to determine whether they meet the firm's minimum acceptance criteria is called
Which pattern of cash flow stream is the most difficult to use when evaluating projects?
Which of the following is a strength of payback period?
Which of the following is a reason for firms not using the payback method as a guideline in capital investment decisions?
Examples of sophisticated capital budgeting techniques include all of the following EXCEPT
The _____ measures the amount of time it takes the firm to recover its initial investment.
Unsophisticated capital budgeting techniques do not
All of the following are weaknesses of the payback period EXCEPT
Many firms use the payback method as a guideline in capital investment decisions. Reasons they do so include all of the following EXCEPT
The minimum return that must be earned on a project in order to leave the firm's value unchanged is
A firm would accept a project with a net present value of zero because
If the nominal rate of interest is 10% per annum and there is quarterly compounding, the effective rate of interest will be:
Relationship between annual nominal rate of interest and annual effective rate of interest, if frequency of compounding is greater than one:
Mr. X takes a loan of Rs 50,000 from HDFC Bank. The rate of interest is 10% per annum. The first installment will be paid at the end of year 5. Determine the amount of equal annual installments if Mr. X wishes to repay the amount in five installments.
If nominal rate of return is 10% per annum and annual effective rate of interest is 10.25% per annum, determine the frequency of compounding:

Which of the following has the largest future value if $1,000 is invested today?
Which of the following is false?
To triple $1 million, Mika invested today at an annual rate of return of 9 percent. How longwill it take Mika to achieve his goal?
Which of the following concepts is incorrect?
Which of the following capital budgeting techniques takes into account the incremental accounting income rather than cash flows:

inflation erodes the value of money over time	investors are impatient	the future is more uncertain than the present
compounding	annuitizing the cash flow	discounting
may be a good investment if the rate of return you can earn an alternative investments is very low	is unambiguously a bad investment	may be a good investment if the rate of return you can earn on alternative investments is very high
$42	$190	$237
$253	$248	$159
future value	present value	compounded value
$519	$400	$77
decreases;increases	decreases;decreases	increases; increases
marginal rate	discount rate	marginal cost
An ordinary annuity is an equal payment paid or received at the end of each period that increases by an equal amount each period.	An annuity due is an equal stream of cash flows that is paid or received at the beginning of each period.	An ordinary annuity is an equal payment paid or received at the beginning of each period.
primia	deep discount	perpetuity
amortized loan	perpetuity	principal
All things being equal, one would prefer to receive an ordinary annuity compared to an annuity due.	The future value of an ordinary annuity is always greater than the future value of an otherwise identical annuity due.	The future value of an annuity due is always greater than the future value of an otherwise identical ordinary annuity.
$12,656	$11,300	$39,309
increases	increasing proportionally	changing unpredictably
$3,257	$2,500	$3,044
operating expenditure	capital expenditure	replacement expenditure

Capital; eliminates	Mutually exclusive; eliminates	Independent; does not eliminate
Independent; does not eliminate	Replacement; eliminates	Mutually exclusive; eliminates
working capital constraints	capital rationing	capital dependency
mutually exclusive projects	independent projects	capital projects
inflow followed by a broken series of outlay	outflow followed by a broken cash series	outflow followed by a series of inflows
inflow followed by a series of outflows	outflow followed by a series of both cash inflows and outflows	outflow followed by a series of inflows
internal rate of return	rofitability index	net present value
net present value	payback period	profitability index
it does not explicitly consider the time value of money.	gives explicit consideration to the timing of cash flows and therefore the time value of money.	does not gives explicit consideration on the recovery of initial investment and possibility of a calamity.
It does not explicitly consider the time value of money.	It does not examine the size of the initial outlay.	It does not take into account an unconventional cash flow pattern.
the interest rate	the compound rate	the internal rate of return
its NPV equals 0	its payback period is one year or less	its net profit after taxes equals 0
the project would maintain the wealth of the firm's owners	the project would enhance the earnings of the firm	the project would maintain the earnings of the firm
cost of capital	payback period	net present value
internal rate of return	risk-free rate	opportunity cost
primary interest.	compound interest.	future value.
future value of an annuity.	present value.	future value.
increases; increases	decreases; increases	increases; decreases

changing unpredictably.	increasing.	decreasing.
present value of an annuity.	future value of an annuity.	present value of a dollar.
A mixed stream	An annuity	A non-conventional
inflow followed by a series of outflows.	outflow followed by a series of inflows.	inflow followed by a broken series.
independent projects.	replacement projects.	mutually exclusive projects.
the accept-reject approach.	the ranking approach.	an independent investment.
Nonconventional flow.	Annuity.	Mixed stream.
only an implicit consideration of the timing of cash flows	It's simple to calculate and understand.	merely a subjectively determined number
It gives an explicit consideration to the timing of cash flows.	The optimal payback period cannot be specified in light of the wealth maximization goal.	it is easy to calculate and has intuitive appeal.
internal rate of return.	annualized net present value.	net present value.
payback period	net present value	internal rate of return
use net profits as a measure of return.	explicitly consider the time value of money.	examine the size of the initial outlay.
only an implicit consideration of the timing of cash flows.	it uses cash flows, not accounting profits.	the difficulty of specifying the appropriate payback period.
it is a measure of risk exposure.	it gives an implicit consideration to the timing of cash flows.	it is easy to calculate.
the cost of capital.	the interest rate.	the compound rate.
the return on the project would be zero.	the project would enhance the wealth of the firm's owners.	the project would maintain the wealth of the firm's owners.
10% per annum	10.10 per annum	10.25%per annum
Effective rate > Nominal rate	Effective rate < Nominal rate	Effective rate = Nominal rate
19310	19311	19312
1	2	3

Five years with a simple annual interest rate of 10 percent	10 years with a simple annual interest rate of 8 percent	Eight years with a compound annual interest rate of 8 percent
The longer the time period, the smaller the present value, given a $100 future value andholding the interest rate constant.	The greater the interest rate, the greater the present value, given a $100 future value andholding the time period constant.	A future dollar is always less valuable than a dollar today if interest rates are positive.
15.5 years	13.9 Years	12.7 years
An ordinary annuity has payments at the end of each year.	An annuity due has payments at the beginning of each year.	A perpetuity is considered a perpetual annuity
NPV	IRR	ARR

investors can earn a return on money they have today and thereby have more money in the future	**investors can earn a return on money they have today and thereby have more money in the future**
present value	**compounding**
is unambiguously a good investment	**may be a good investment if the rate of return you can earn an alternative investments is very low**
$10	**$42**
$252	**$252**
future value of an annuity	**present value**
$50	**$77**
increases; decreases	**increases; increases**
risk-free rate	**discount rate**
An annuity due is a payment paid or received at the beginning of each period that increases by an equal amount each period.	**An annuity due is an equal stream of cash flows that is paid or received at the beginning of each period.**
option	**perpetuity**
APR	**APR**
The present value of an annuity due is always less than the future value of an otherwise identical ordinary annuity, since one less payment is received with an annuity due.	**The future value of an annuity due is always greater than the future value of an otherwise identical ordinary annuity.**
$35,097	**$35,097**
decreases	**decreases**
$4,036	**$3,044**
financing expenditure	**capital expenditure**

Replacement; eliminates	**Independent; does not eliminate**
Capital; eliminates	**Mutually exclusive; eliminates**
capital gains	**capital rationing**
replacement projects	**mutually exclusive projects**
outflow followed by a series of outflows	**outflow followed by a series of inflows**
inflow followed by a series of both cash inflows and outflows	**outflow followed by a series of both cash inflows and outflows**
payback period approach	**payback period approach**
internal rate of return	**payback period**
gives explicit consideration to risk exposure due to the use of the cost of capital as a discount rate.	**it does not explicitly consider the time value of money.**
It does not use net profits as a measure of return.	**It does not explicitly consider the time value of money.**
the cost of capital	**the cost of capital**
its IRR equals 0	**its NPV equals 0**
the project would enhance the wealth of the firm's owners	**the project would maintain the wealth of the firm's owners**
internal rate of return	**internal rate of return**
cost of capital	**internal rate of return**
discount interest.	**compound interest.**
present value of an annuity.	**present value.**
decreases; decreases	**increases; increases**

increasing proportionally.	**decreasing.**
future value of a dollar.	**present value of an annuity.**
A conventional	**An annuity**
outflow followed by a broken cash series.	**outflow followed by a series of inflows.**
none of the above.	**replacement projects.**
a mutually exclusive investment.	**the accept-reject approach.**
conventional flow.	**Nonconventional flow.**
a disregard for cash flows after the payback period	**It's simple to calculate and understand.**
It is a measure of risk exposure and projects the possibility of a calamity.	**The optimal payback period cannot be specified in light of the wealth maximization goal.**
payback period.	**payback period.**
average rate of return	**payback period**
take into account an unconventional cash flow pattern.	**explicitly consider the time value of money.**
a disregard for cash flows after the payback period.	**it uses cash flows, not accounting profits.**
it recognizes cash flows which occur after the payback period.	**it recognizes cash flows which occur after the payback period.**
the internal rate of return.	**the cost of capital.**
the return on the project would be positive.	**the project would maintain the wealth of the firm's owners.**
10.38% per annum	**10.38% per annum**
Nominal Rate > Effective Rate	**Effective rate > Nominal rate**
19313	**19310**
4	**2**

Eight years with a compound annual interest rate of 7 percent	**Eight years with a compound annual interest rate of 8 percent**
The discount factor is the reciprocal of the compound factor	**The greater the interest rate, the greater the present value, given a $100 future value andholding the time period constant.**
10 years	**12.7 Years**
An ordinary annuity has a greater PV than an annuity due, if they both have the same periodic payments, discount rate and time period.	**An ordinary annuity has a greater PV than an annuity due, if they both have the same periodic payments, discount rate and time period.**
PB	**ARR**

Chapter

5

Capital Structure

INTRODUCTION

Capital is the major part of all kinds of business activities, which are decided by the size, and nature of the business concern. Capital may be raised with the help of various sources. If the company maintains proper and adequate level of capital, it will earn high profit and they can provide more dividends to its shareholders.

Meaning of Capital Structure

Capital structure refers to the kinds of securities and the proportionate amounts that make up capitalization. It is the mix of different sources of long-term sources such as equity shares, preference shares, debentures, long-term loans and retained earnings.

The term capital structure refers to the relationship between the various long-term source financing such as equity capital, preference share capital and debt capital. Deciding the suitable capital structure is the important decision of the financial management because it is closely related to the value of the firm.

Capital structure is the permanent financing of the company represented primarily by long-term debt and equity.

Definition of Capital Structure

The following definitions clearly initiate, the meaning and objective of the capital structures.

According to the definition of **Gerestenbeg,** "Capital Structure of a company refers to the composition or make up of its capitalization and it includes all long-term capital resources".

According to the definition of **James C. Van Horne,** "The mix of a firm's permanent long-term financing represented by debt, preferred stock, and common stock equity".

According to the definition of **Presana Chandra,** "The composition of a firm's financing consists of equity, preference, and debt".

According to the definition of **R.H. Wessel,** "The long term sources of fund employed in a business enterprise".

FINANCIAL STRUCTURE

The term financial structure is different from the capital structure. Financial structure shows the pattern total financing. It measures the extent to which total funds are available to finance the total assets of the business.

$$\text{Financial Structure} = \text{Total liabilities}$$

Or

$$\text{Financial Structure} = \text{Capital Structure} + \text{Current liabilities.}$$

The following points indicate the difference between the financial structure and capital structure.

Financial Structures	Capital Structures
1. It includes both long-term and short-term sources of funds	1. It includes only the long-term sources of funds.
2. It means the entire liabilities side of the balance sheet.	2. It means only the long-term liabilities of the company.
3. Financial structures consist of all sources of capital.	3. It consist of equity, preference and retained earning capital.
4. It will not be more important while determining the value of the firm.	4. It is one of the major determinations of the value of the firm.

Example

From the following information, calculate the capitalization, capital structure and financial structures.

Balance Sheet

Liabilities		Assets	
Equity share capital	50,000	Fixed assets	25,000
Preference share capital	5,000	Good will	10,000
Debentures	6,000	Stock	15,000
Retained earnings	4,000	Bills receivable	5,000
Bills payable	2,000	Debtors	5,000
Creditors	3,000	Cash and bank	10,000
	70,000		70,000

(i) Calculation of Capitalization

S. No.	Sources	Amount
1.	Equity share capital	50,000
2.	Preference share capital	5,000
3.	Debentures	6,000
	Capitalization	**61,000**

(ii) Calculation of Capital Structures

S. No.	Sources	Amount	Proportion
1.	Equity share capital	50,000	76.92
2.	Preference share capital	5,000	7.69
3.	Debentures	6,000	9.23
4.	Retained earnings	4,000	6.16
		65,000	**100%**

(iii) Calculation of Financial Structure

S. No.	Sources	Amount	Proportion
1.	Equity share capital	50,000	71.42
2.	Preference share capital	5,000	7.14
3.	Debentures	6,000	8.58
4 .	Retained earnings	4,000	5.72
5.	Bills payable	2,000	2.85
6.	Creditors	3,000	4.29
		70,000	**100%**

OPTIMUM CAPITAL STRUCTURE

Optimum capital structure is the capital structure at which the weighted average cost of capital is minimum and thereby the value of the firm is maximum.

Optimum capital structure may be defined as the capital structure or combination of debt and equity, that leads to the maximum value of the firm.

Objectives of Capital Structure

Decision of capital structure aims at the following two important objectives:

1. Maximize the value of the firm.
2. Minimize the overall cost of capital.

Forms of Capital Structure

Capital structure pattern varies from company to company and the availability of finance. Normally the following forms of capital structure are popular in practice.

- Equity shares only.
- Equity and preference shares only.
- Equity and Debentures only.
- Equity shares, preference shares and debentures.

FACTORS DETERMINING CAPITAL STRUCTURE

The following factors are considered while deciding the capital structure of the firm.

Leverage

It is the basic and important factor, which affect the capital structure. It uses the fixed cost financing such as debt, equity and preference share capital. It is closely related to the overall cost of capital.

Cost of Capital

Cost of capital constitutes the major part for deciding the capital structure of a firm. Normally long- term finance such as equity and debt consist of fixed cost while mobilization. When the cost of capital increases, value of the firm will also decrease. Hence the firm must take careful steps to reduce the cost of capital.

(a) Nature of the business: Use of fixed interest/dividend bearing finance depends upon the nature of the business. If the business consists of long period of operation, it will apply for equity than debt, and it will reduce the cost of capital.

(b) Size of the company: It also affects the capital structure of a firm. If the firm belongs to large scale, it can manage the financial requirements with the help of internal sources. But if it is small size, they will go for external finance. It consists of high cost of capital.

(c) Legal requirements: Legal requirements are also one of the considerations while dividing the capital structure of a firm. For example, banking companies are restricted to raise funds from some sources.

(d) Requirement of investors: In order to collect funds from different type of investors, it will be appropriate for the companies to issue different sources of securities.

Government policy

Promoter contribution is fixed by the company Act. It restricts to mobilize large, long-term funds from external sources. Hence the company must consider government policy regarding the capital structure.

CAPITAL STRUCTURE THEORIES

Capital structure is the major part of the firm's financial decision which affects the value of the firm and it leads to change EBIT and market value of the shares. There is a relationship among the capital structure, cost of capital and value of the firm. The aim of effective capital structure is to maximize the value of the firm and to reduce the cost of capital.

There are two major theories explaining the relationship between capital structure, cost of capital and value of the firm.

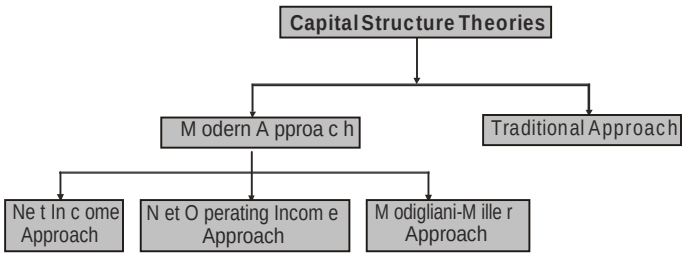


Fig. 5.1 *Capital Structure Theories*

Traditional Approach

It is the mix of Net Income approach and Net Operating Income approach. Hence, it is also called as intermediate approach. According to the traditional approach, mix of debt and equity capital can increase the value of the firm by reducing overall cost of capital up to certain level of debt. Traditional approach states that the K_o decreases only within the responsible limit of financial leverage and when reaching the minimum level, it starts increasing with financial leverage.

Assumptions

Capital structure theories are based on certain assumption to analysis in a single and convenient manner:

- There are only two sources of funds used by a firm; debt and shares.
- The firm pays 100% of its earning as dividend.
- The total assets are given and do not change.
- The total finance remains constant.
- The operating profits (EBIT) are not expected to grow.
- The business risk remains constant.
- The firm has a perpetual life.
- The investors behave rationally.

Exercise 1

ABC Ltd., needs Rs. 30,00,000 for the installation of a new factory. The new factory expects to yield annual earnings before interest and tax (EBIT) of Rs.5,00,000. In choosing a financial plan, ABC Ltd., has an objective of maximizing earnings per share (EPS). The company proposes to issuing ordinary shares and raising debit of Rs. 3,00,000 and Rs. 10,00,000 of Rs. 15,00,000. The current market price per share is Rs. 250 and is expected to drop to Rs. 200 if the funds are borrowed in excess of Rs. 12,00,000. Funds can be raised at the following rates.

–up to Rs. 3,00,000 at 8%

–over Rs. 3,00,000 to Rs. 15,000,00 at 10%

–over Rs. 15,00,000 at 15%

Assuming a tax rate of 50% advise the company.

Solution

Earnings Before Interest and Tax (BIT) less Interest Earnings Before Tax less: Tax@50%.

Alternatives		
I (Rs. 3,00,000 debt)	II Rs. 10,00,000 debt)	III (Rs. 15,00,000 debt)
5,00,000 24,000	5,00,000 1,00,000	5,00,000 2,25,000
4,76,000 2,38,000	4,00,000 2,00,000	2,75,000 1,37,500
2,38,000 27,00,000 250 10800 2,38,000	2,00,000 20,00,000 250 8,000 2,00,000	1,37,500 15,00,000 200 7,500 1,37,500
No. of shares 10,800 Earnings per share 22.03	8,000 25	7,500 18.33

The secure alternative which gives the highest earnings per share is the best. Therefore the company is advised to revise Rs. 10,00,000 through debt amount Rs. 20,00,000 through ordinary shares.

Exercise 2

Compute the market value of the firm, value of shares and the average cost of capital from the following information.

Net operating income Rs. 1,00,000

Total investment Rs. 5,00,000

Equity capitalization Rate:

(a) If the firm uses no debt 10%

(b) If the firm uses Rs. 25,000 debentures 11%

(c) If the firm uses Rs. 4,00,000 debentures 13%

Assume that Rs. 5,00,000 debentures can be raised at 6% rate of interest whereas Rs. 4,00,000 debentures can be raised at 7% rate of interest.

Solution

Computation of market value of firm value of shares and the average cost of capital.

Particulars	(a) No Debt	(b) Rs. 2,50,000 6% debentures	(c) Rs. 4,00,000 7% debentures
Net operating system	1,00,000	1,00,000	1,00,000
(–) Interest (i.e.) Cost of debt	–	15,000	28,000
Earnings available to Equity shareholders	1,00,000	85,000	72,000
Equity Capitalization Rate	10%	11%	13%
Market value of shares	$10{,}000 \times \frac{10}{100}$	$85{,}000 \times \frac{100}{11}$	$72{,}000 \times \frac{100}{13}$
Market Value of firm	Rs. 10,00,000/- 10,00,000 1,00,000	Rs.772727/- 10,22,727 1,00,000	Rs.553846/- 9,53,846 1,00,000
Average cost of capital	$\frac{1{,}00{,}000}{10{,}00{,}000} \times 100$	$\frac{1{,}00{,}000}{10{,}22{,}727} \times 100$	$\frac{1{,}00{,}000}{9{,}53{,}846} \times 100$
$\frac{\text{Earnings}}{\text{Value of the firm}}$			
$\frac{\text{EBIT}}{\text{V}}$	=10%	=9.78%	=10.48%

Comments

From the above data, if debt of Rs. 2,50,000 is used, the value of the firm increases and the overall cost of capital decreases. But, if more debt is used to finance in place of equity i.e., Rs. 4,00,000 debentures, the value of the firm decreases and the overall cost of capital increases.

Net Income (NI) Approach

Net income approach suggested by the Durand. According to this approach, the capital structure decision is relevant to the valuation of the firm. In other words, a change in the capital structure leads to a corresponding change in the overall cost of capital as well as the total value of the firm.

According to this approach, use more debt finance to reduce the overall cost of capital and increase the value of firm.

Net income approach is based on the following three important assumptions:

1. There are no corporate taxes.
2. The cost debt is less than the cost of equity.
3. The use of debt does not change the risk perception of the investor.

where

$V = S+B$

V = Value of firm

S = Market value of equity

B = Market value of debt

Market value of the equity can be ascertained by the following formula:

$$S = \frac{NI}{K_e}$$

where

NI = Earnings available to equity shareholder

K_e = Cost of equity/equity capitalization rate

Format for calculating value of the firm on the basis of NI approach.

Particulars	Amount
Net operating income (EBIT)	XXX
Less: interest on debenture (i)	XXX
Earnings available to equity holder (NI)	XXX
Equity capitalization rate (K_e)	XXX
Market value of equity (S)	XXX
Market value of debt (B)	XXX
Total value of the firm (S+B)	XXX
Overall cost of capital = K_o = EBIT/V(%)	XXX%

Exercise 3

(a) A Company expects a net income of Rs. 1,00,000. It has Rs. 2,50,000, 8% debentures. The equality capitalization rate of the company is 10%. Calculate the value of the firm and overall capitalization rate according to the net income approach (ignoring income tax).

(b) If the debenture debts are increased to Rs. 4,00,000. What shall be the value of the firm and the overall capitalization rate?

Solution

(a) Capitalization of the value of the firm

	Rs.
Net income	1,00,000
Less: Interest on 8% Debentures of Rs. 2,50,000	20,000
Earnings available to equality shareholders	80,000
Equity capitalization rate	10%

$$= \frac{80,000}{10} \times 100$$

Market value of equity = 8,00,000
Market value of debentures = 2,50,000
Value of the firm = 10,50,000

Calculation of overall capitalization rate

$$\text{Overall cost of capital } (K_o) = \frac{\text{Earnings}}{\text{Value of the firm}} \quad \frac{EBIT}{V}$$

$$= \frac{1,00,000}{10,50,000} \times 100$$

$$= 9.52\%$$

(b) Calculation of value of the firm if debenture debt is raised to Rs. 3,00,000.

	Rs.
Net income	1,00,000
Less: Interest on 8% Debentures of Rs. 4,00,000	32,000
Equity Capitalization rate	68,000
	10%

Market value of equity $= 68,000 \times \frac{100}{10} = 6,80,000$

$= 6,80,000$
Market value of Debentures = 4,00,000
Value of firm = 10,80,000

$$\text{Overall cost of capital} = \frac{1,00,000}{10,80,000} \times 10$$

$$= 9.26\%$$

Thus, it is evident that with the increase in debt financing, the value of the firm has increased and the overall cost of capital has increased.

Net Operating Income (NOI) Approach

Another modern theory of capital structure, suggested by **Durand**. This is just the opposite to the Net Income approach. According to this approach, Capital Structure decision is irrelevant to the valuation of the firm. The market value of the firm is not at all affected by the capital structure changes.

According to this approach, the change in capital structure will not lead to any change in the total value of the firm and market price of shares as well as the overall cost of capital.

NI approach is based on the following important assumptions;

The overall cost of capital remains constant;

There are no corporate taxes;

The market capitalizes the value of the firm as a whole;

Value of the firm (V) can be calculated with the help of the following formula

$$V = \frac{EBIT}{K_o}$$

Where,

V = Value of the firm

EBIT = Earnings before interest and tax

K_o = Overall cost of capital

Exercise 4

XYZ expects a net operating income of Rs. 2,00,000. It has 8,00,000, 6% debentures. The overall capitalization rate is 10%. Calculate the value of the firm and the equity capitalization rate (Cost of Equity) according to the net operating income approach.

If the debentures debt is increased to Rs. 10,00,000. What will be the effect on volume of the firm and the equity capitalization rate?

Solution

Net operating income = Rs. 2,00,000

Overall cost of capital = 10%

Market value of the firm (V)

$$= \frac{EBIT}{K_o}$$

$$= 2,00,000 \times \frac{100}{10} = \text{Rs. } 20,00,000$$

Market value of the firm = Rs. 20,00,000

Less: market value of Debentures = Rs. 8,00,000

12,00,000

Equity capitalization rate (or) cost of equity (K_e)

$$= \frac{EBIT - I}{V - D}$$

Where, V = value of the firm

D = value of the debt capital

$$= \frac{2,00,000 - 48,000}{20,00,000 - 8,00,000} \times 100$$

$$= 12.67\%$$

If the debentures debt is increased to Rs. 10,00,000, the value of the firm shall remain changed to Rs. 20,00,000. The equity capitalization rate will increase as follows:

$$= \frac{EBIT - I}{V - D}$$

$$= \frac{2,00,000 - 60,000}{20,00,000 - 10,00,000} \times 100$$

$$= \frac{1,40,000}{10,00,000} \times 100$$

$$= 14\%.$$

Exercise 5

Abinaya company Ltd. expresses a net operating income of Rs. 2,00,000. It has Rs. 8,00,000 to 7% debentures. The overall capitalization rate is 10%.

(a) Calculate the value of the firm and the equity captialization rate (or) cost of equity according to the net operating income approach.

(b) If the debenture debt is increasesd to Rs. 12,00,000. What will be the effect on the value of the firm, the equity capitalization rate?

Solution

(a) Net operating income = Rs. 2,00,000

Over all cost of capital = 10%

Market value of the firm (V)

$$\frac{NOI(EBIT)}{\text{Overall cost of capital}(OK)}$$

$$= 2,00,000 \times 100/10$$

$$= \text{Rs. } 20,00,000$$

Market value of firm = Rs. 20,00,000

Less Market value of debentures = Rs. 8,00,000

Total marketing value of equity = Rs. 12,00,000

Equity capitalization rate (or) cost of equity (K_e)

$$= \frac{EBIT - I}{V - D}$$

$$= \frac{2,00,000 - 56,000}{20,00,000 - 8,00,000} \times 100$$

$$= \frac{1,44,000}{12,00,000} \times 100$$

$$= 12\%$$

where I = Interest of debt

V = Value of the firm

D = Value of debt capital

I = 8,00,000×7%=56,000

V = 20,00,000

D = 8,00,000

(b) If the debenture debt is increased at Rs. 12,00,000, the value of the firm shall changed to Rs. 20,00,000.

Equity Capitalization Rate (K_e)

$$= \frac{EBIT - I}{V - D}$$

$$= \frac{2,00,000 - 84,000}{20,00,000 - 12,00,000}$$

$$= 14.5\%$$

where I= 12,00,000 at 7% = 84,000

Modigliani and Miller Approach

Modigliani and Miller approach states that the financing decision of a firm does not affect the market value of a firm in a perfect capital market. In other words MM approach maintains that the average cost of capital does not change with change in the debt weighted equity mix or capital structures of the firm.

Modigliani and Miller approach is based on the following important assumptions:

- There is a perfect capital market.
- There are no retained earnings.
- There are no corporate taxes.
- The investors act rationally.
- The dividend payout ratio is 100%.
- The business consists of the same level of business risk.

Value of the firm can be calculated with the help of the following formula:

$$\frac{EBIT}{K_o}(1 - t)$$

Where

EBIT = Earnings before interest and tax

K_o = Overall cost of capital

t = Tax rate

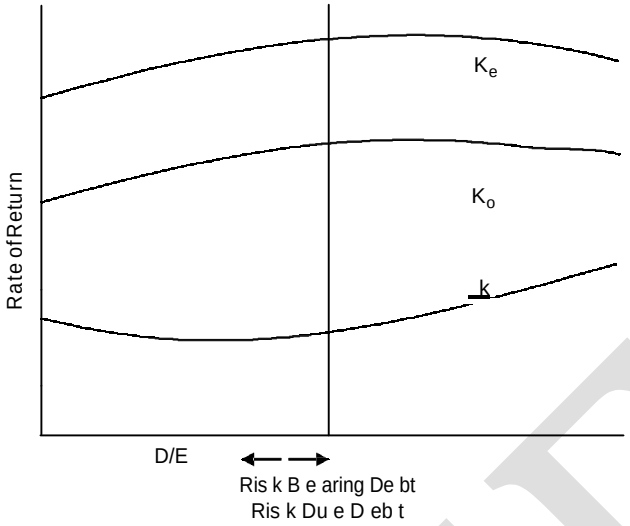


Fig. 5.2 *Modigliani and Miller Approach*

Exercise 6

There are two firms 'A' and 'B' which are exactly identical except that A does not use any debt in its financing, while B has Rs. 2,50,000 , 6% Debentures in its financing. Both the firms have earnings before interest and tax of Rs. 75,000 and the equity capitalization rate is 10%. Assuming the corporation tax is 50%, calculate the value of the firm.

Solution

The market value of firm A which does not use any debt.

$$V_u = \frac{EBIT}{K_o}$$

$$= \frac{75,000}{10/100} = 75,000 \times 100/10$$

$$= \text{Rs. } 7,50,000$$

The market value of firm B which uses debt financing of Rs. 2,50,000

$$V_t = V_u + t$$

$V_u = 7,50,000, \qquad t = 50\%$ of Rs. 2,50,000

$$= 7,50,000 + 1,25,000$$

$$= \text{Rs. } 8,75,000$$

Exercise 7

The following data regarding the two companies 'X' and 'Y' belonging to the same equivalent class:

	Company 'X'	Company 'Y'
Number of ordinary shares	75,000	1,25,000
5% debentures	40,000	–
Market price per shares	Rs. 1.25	Rs. 1.00
Profit before interest	Rs. 25,000	Rs. 25,000

All profits after paying debenture interest are distributed as dividends.

You are required to explain how under Modigliani and Miller approach, an investor holding 10% of shares in company 'X' will be better off in switching his holding to company 'Y'.

Solution

As per the opinion of Modigliani and Miller, two similar firms in all respects except their capital structure cannot have different market values because of arbitrage process. In case two similar firms except for their capital structure have different market values, arbitrage will take place and the investors will engage in 'personal leverage' as against the corporate leverage. In the given problem, the arbitrage will work out as below.

1. The investor will sell in the market 10% of shares in company 'X' for

$$75{,}000 \times 10/100 \times 1.25 = \text{Rs. } 9375$$

2. He will raise a loan of Rs. $40{,}000 \times 10/100 = \text{Rs. } 4000$

To take advantage of personal leverage as against the corporate leverage the company 'Y' does not use debt content in its capital structure. He will put 13375 shares in company 'Y' with the total amount realized from 1 and 2 i.e., Rs. 9375 plus Rs. 4000. Thus he will have 10.7% of shares in company 'Y'.

The investor will gain by switching his holding as below:

Present income of the investor in company 'X'	**Rs.**
Profit before Interest of the Company	25,000
Less: Interest on Debentures 5%	2,000
Profit after Interest	23,000

Share of the investor = 10% of Rs. 23,000 i.e., Rs. 2300

Income of the investor after switching holding to company

Profit before Interest of the company	Rs. 25,000
Less Interest	——
Profit after Interest	25,000
Share of the investor : $25{,}000 \times \frac{13{,}375}{1{,}25{,}000}$	= Rs. 2,675
Interest paid on loan taken $4000 \times 5/100$	200
Net Income of the Investor	**2,475**

As the net income of the investor in company 'Y' is higher than the cost of income from company 'X' due to switching the holding, the investor will gain in switching his holdings to company 'Y'.

Exercise 8

Paramount Products Ltd. wants to raise Rs. 100 lakh for diversification project. Current estimates of EBIT from the new project is Rs. 22 lakh p.a.

Cost of debt will be 15% for amounts up to and including Rs. 40 lakh, 16% for additional amounts up to and including Rs. 50 lakh and 18% for additional amounts above Rs. 50 lakh. The equity shares (face value of Rs. 10) of the company have a current market value of Rs. 40. This is expected to fall to Rs. 32 if debts exceeding Rs. 50 lakh are raised. The following options are under consideration of the company.

Option	Debt	Equity
I	50%	50%
II	40%	60%
III	60%	40%

Determine EPS for each option and state which option should the Company adopt. Tax rate is 50%. **(ICWA Inter Dec. 1997)**

Solution

	I	II	III
Equity	50,00,000	60,00,000	40,00,000
Debt	50,00,000	40,00,000	60,00,000
Amount to be raised	1,00,00,000	1,00,00,000	1,00,00,000
EBIT	22,00,000	22,00,000	22,00,000
Less: Interest of Debt	7,60,000	6,00,000	9,40,000
PBT	14,40,000	16,00,000	12,60,000
Less : Tax @ 50%	7,20,000	8,00,000	6,30,000
PAT	7,20,000	8,00,000	6,30,000
No. of equity shares	1,25,000	1,50,000	1,25,000
	Rs. 5.76	Rs. 5.33	Rs. 5.04

Working Notes

Calculation of Interest on Debt

Total Debt	I	II	III
Interest on:	50,00,000	40,00,000	60,00,000
Ist Rs. 40,00,000 @ 15%	6,00,000	6,00,000	6,00,000
Next Rs.10,00,000 @ 16%	1,60,000	–	1,60,000
Balance Rs. 10,00,000 @ 18%	–	–	1,80,000
	7,60,000	6,00,000	9,40,000

Exercise 9

The following is the data regarding two Company's. X and Y belonging to the same risk class.

	X	Y
No. of ordinary shares	90,000	1,50,000
Market price/share (Rs.)	1.2	1.0
6% debentures	60,000	–
Profit before interest	18,000	18,000

All profits after interest are distributed as dividend.

Explain how under Modigliani & Miller Approach an investor holding 10% of shares in Company X will be better off in switching his holding to Company Y.

(CA Final Nov. 1993)

Solution

Both the firms have EBIT of Rs. 18,000. Company X has to pay interest of Rs. 3600 (i.e., 6% on Rs. 60,000) and the remaining profit of Rs. 14,400 is being distributed among the shareholders. The Company Y on the other hand has no interest liability and therefore is distributing Rs.18,000 among the shareholders.

The investor will be well off under MM Model by selling the shares of X and shifting to shares of Y company through the arbitrage process as follows. If he sells shares of X Company He gets Rs. 10,800 (9,000 shares @ Rs.1.2 per share). He now takes a 6% loan of Rs.6,000

(*i.e.* 105 of Rs. 60,000) and out of the total cash of Rs. 16,800 he purchases 10% of shares of Company Y for Rs. 15,000; his position with regard to Company Y would be as follows:

	X	Y
Dividends (10% of Profits)	1,440	1,800
Less:Interest (6% on Rs. 6,000)	–	360
Net Income	1,440	1,440

Thus by shifting from Company Y the investor is able to get the same income of Rs. 1,440 and still having funds of Rs. 1,800 (i.e., Rs. 16,800 – 15,000) at his disposal. He is better off not in terms of income but in terms of having capital of Rs. 1,800 with him which he can invest elsewhere.

Exercise 10

Gentry Motors Ltd., a producer of turbine generators, is in this situation; EBIT = Rs. 40 lac. rate =35%, dept. outstanding = D = Rs. 20 lac., rate of Interest =10%, K_e = 15%, shares of stock outstanding = No. = Rs. 6,00,000 and book value per share = Rs. 10. Since Gentry's product market is stable and the Company expects no growth, all earnings are paid out as dividends. The debt consists of perpetual bonds. What are the Gentry's EBS and its price per share, P_o? **(CS Final Dec. 1998)**

Solution

(a) EBIT	40,00,000
interest @ 10%	2,00,000
	38,00,000
Tax @ 35%	13,30,000
	24,70,000
No. of shares	6,00,000
EPS (or Dividend)	Rs. 4.12
K_e (given)	15%
P_o (*i.e.*, D/K_e)	4.12/.15
	$\Rightarrow$ Rs. 27.47

In the same question if the Company increases its debt by Rs. 80 lakh to a total of Rs. 1 crore using the new debt to buy and retire of its shares at current price, its interest rate on debt will be 12% and its cost of equity will rise from 15% to 17%. EBIT will remain constant, should this Company change its capital structure.

If Company decides to increase its debt by Rs. 80 lacs, the Company may buy back 80,00,000 ÷ 27.47 = 2,91,226 shares. Thereafter the remaining no. of shares would be 3,08,774 (*i.e.*, 6,00,000 – 2,91,226).

The market price of the share may be ascertained as follows:

EBIT	40,00,000
Interest @ 12% on Rs. 1 crore	12,00,000
	28,00,000
Tax @ 35%	9,80,000
	18,20,000
No. of equity shares	3,08,774
EPS	Rs. 5.89
K_e	17%
P_o (*i.e.*, D/K_e)	5.89
	.17
	= Rs. 34.64

As the price is expected to rise from 27.47 to Rs 34.64, the Company may change its capital structure by raising debt and retaining some number of shares.

MODEL QUESTIONS

1. Define capital structure.
2. Differentiate the capital structure and financial structure.
3. What is optimum capital structure?
4. Discuss the various factors affecting the capital structure.
5. Explain the capital structure theories.
6. XYZ Ltd., expects a net income of Rs. 1,50,000. The company has 10% of 5,00,000 Debentures. The equity capitalization rate of the company is 10%.
   (a) Calculate the value of the firm and overall capitalization rate according to the net income approach (ignoring income tax).
   (b) If the debenture debt is increased to Rs. 7,50,000 and interest of debt is change to 9%. What is the value of the firm and overall capitalization rate?

   (**Ans.** (a) Rs. 15,00,000, 10% (b) Rs. 15,75,000 and 9.52%)
7. A Company Ltd., projected net operating income of Rs. 75,000. It has Rs. 3,00,000, 8% debentures.
   (a) Calculate the value of the firm according to 10 net opening income and overall capitalization rate is 10%.
   (b) If debenture debt is increased to Rs. 5,00,000. What is the value of the firm and the equity capitalization rate? (**Ans.** (a) Rs. 7,50,000, (b) 11.33%, 14%)
8. According to Traditional approach, compute the market value of the firm, value of shares and the average cost of capital from the following information:

   Net Operating Income 1,00,000

   Total Investment 7,00,000

   Equity capitalization Rate:

   (a) if the firms uses no debt 7%.

   (b) if the firm uses Rs. 2,00,000 debentures 8%

   (c) if the firm uses Rs. 4,00,000 debentures 9%

   Assume that Rs 2,00,000 debentures at 6% rate of interest whereas Rs. 4,00,000 debentures at 6% rate of interest whereas Rs. 4,00,000 debentures at 7% rate of interest. (**Ans.** 7%, 7.69%, 8.33)

Chapter

6

Cost of Capital

INTRODUCTION

Cost of capital is an integral part of investment decision as it is used to measure the worth of investment proposal provided by the business concern. It is used as a discount rate in determining the present value of future cash flows associated with capital projects. Cost of capital is also called as cut-off rate, target rate, hurdle rate and required rate of return. When the firms are using different sources of finance, the finance manager must take careful decision with regard to the cost of capital; because it is closely associated with the value of the firm and the earning capacity of the firm.

Meaning of Cost of Capital

Cost of capital is the rate of return that a firm must earn on its project investments to maintain its market value and attract funds.

Cost of capital is the required rate of return on its investments which belongs to equity, debt and retained earnings. If a firm fails to earn return at the expected rate, the market value of the shares will fall and it will result in the reduction of overall wealth of the shareholders.

Definitions

The following important definitions are commonly used to understand the meaning and concept of the cost of capital.

According to the definition of **John J. Hampton** " Cost of capital is the rate of return the firm required from investment in order to increase the value of the firm in the market place".

According to the definition of **Solomon Ezra,** "Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditure".

According to the definition of James **C. Van Horne**, Cost of capital is "A cut-off rate for the allocation of capital to investment of projects. It is the rate of return on a project that will leave unchanged the market price of the stock".

According to the definition of **William and Donaldson**, "Cost of capital may be defined as the rate that must be earned on the net proceeds to provide the cost elements of the burden at the time they are due".

Assumption of Cost of Capital

Cost of capital is based on certain assumptions which are closely associated while calculating and measuring the cost of capital. It is to be considered that there are three basic concepts:

1. It is not a cost as such. It is merely a hurdle rate.
2. It is the minimum rate of return.
3. It consis of three important risks such as zero risk level, business risk and financial risk.

Cost of capital can be measured with the help of the following equation.

$$K = r_j + b + f.$$

Where,

K = Cost of capital.

r_j = The riskless cost of the particular type of finance.

b = The business risk premium.

f = The financial risk premium.

CLASSIFICATION OF COST OF CAPITAL

Cost of capital may be classified into the following types on the basis of nature and usage:

- Explicit and Implicit Cost.
- Average and Marginal Cost.
- Historical and Future Cost.
- Specific and Combined Cost.

Explicit and Implicit Cost

The cost of capital may be explicit or implicit cost on the basis of the computation of cost of capital.

Explicit cost is the rate that the firm pays to procure financing. This may be calculated with the help of the following equation;

$$CI_o = \sum_{t=1}^{n} \frac{CO_t}{(t + C)^t}$$

Where,

CI_o = initial cash inflow

C = outflow in the period concerned

N = duration for which the funds are provided

T = tax rate

Implicit cost is the rate of return associated with the best investment opportunity for the firm and its shareholders that will be forgone if the projects presently under consideration by the firm were accepted.

Average and Marginal Cost

Average cost of capital is the weighted average cost of each component of capital employed by the company. It considers weighted average cost of all kinds of financing such as equity, debt, retained earnings etc.

Marginal cost is the weighted average cost of new finance raised by the company. It is the additional cost of capital when the company goes for further raising of finance.

Historical and Future Cost

Historical cost is the cost which as already been incurred for financing a particular project. It is based on the actual cost incurred in the previous project.

Future cost is the expected cost of financing in the proposed project. Expected cost is calculated on the basis of previous experience.

Specific and Combine Cost

The cost of each sources of capital such as equity, debt, retained earnings and loans is called as specific cost of capital. It is very useful to determine the each and every specific source of capital.

The composite or combined cost of capital is the combination of all sources of capital. It is also called as overall cost of capital. It is used to understand the total cost associated with the total finance of the firm.

IMPORTANCE OF COST OF CAPITAL

Computation of cost of capital is a very important part of the financial management to decide the capital structure of the business concern.

Importance to Capital Budgeting Decision

Capital budget decision largely depends on the cost of capital of each source. According to net present value method, present value of cash inflow must be more than the present value of cash outflow. Hence, cost of capital is used to capital budgeting decision.

Importance to Structure Decision

Capital structure is the mix or proportion of the different kinds of long term securities. A firm uses particular type of sources if the cost of capital is suitable. Hence, cost of capital helps to take decision regarding structure.

Importance to Evolution of Financial Performance

Cost of capital is one of the important determine which affects the capital budgeting, capital structure and value of the firm. Hence, it helps to evaluate the financial performance of the firm.

Importance to Other Financial Decisions

Apart from the above points, cost of capital is also used in some other areas such as, market value of share, earning capacity of securities etc. hence, it plays a major part in the financial management.

COMPUTATION OF COST OF CAPITAL

Computation of cost of capital consists of two important parts:

1. Measurement of specific costs
2. Measurement of overall cost of capital

Measurement of Cost of Capital

It refers to the cost of each specific sources of finance like:

- Cost of equity
- Cost of debt
- Cost of preference share
- Cost of retained earnings

Cost of Equity

Cost of equity capital is the rate at which investors discount the expected dividends of the firm to determine its share value.

Conceptually the cost of equity capital (K_e) defined as the "Minimum rate of return that a firm must earn on the equity financed portion of an investment project in order to leave unchanged the market price of the shares".

Cost of equity can be calculated from the following approach:

- Dividend price (D/P) approach
- Dividend price plus growth (D/P + g) approach
- Earning price (E/P) approach
- Realized yield approach.

Dividend Price Approach

The cost of equity capital will be that rate of expected dividend which will maintain the present market price of equity shares.

Dividend price approach can be measured with the help of the following formula:

$$K_e = \frac{D}{N_p}$$

Where,

K_e = Cost of equity capital

D = Dividend per equity share

N_p = Net proceeds of an equity share

Exercise 1

A company issues 10,000 equity shares of Rs. 100 each at a premium of 10%. The company has been paying 25% dividend to equity shareholders for the past five years and expects to maintain the same in the future also. Compute the cost of equity capital. Will it make any difference if the market price of equity share is Rs. 175?

Solution

$$K_e = \frac{D}{N_p}$$

$$= \frac{25}{100} \times 100$$

$$= 22.72\%$$

If the market price of a equity share is Rs. 175.

$$K_e = \frac{D}{N_p}$$

$$= \frac{25}{175} \times 100$$

$$= 14.28\%$$

Dividend Price Plus Growth Approach

The cost of equity is calculated on the basis of the expected dividend rate per share plus growth in dividend. It can be measured with the help of the following formula:

$$K_e = \frac{D}{N_p} + g$$

Where,

K_e = Cost of equity capital

D = Dividend per equity share

g = Growth in expected dividend

N_p = Net proceeds of an equity share

Exercise 2

(a) A company plans to issue 10000 new shares of Rs. 100 each at a par. The floatation costs are expected to be 4% of the share price. The company pays a dividend of Rs. 12 per share initially and growth in dividends is expected to be 5%. Compute the cost of new issue of equity shares.

(b) If the current market price of an equity share is Rs. 120. Calculate the cost of existing equity share capital

Solution

(a) $$K_e = \frac{D}{N_p} + g$$

$$= \frac{12}{100 - 4} + 5 = 17.5\%$$

(b) $$K_e = \frac{D}{N_p} + g$$

$$= \frac{12}{120} + 5\% = 15\%$$

Exercise 3

The current market price of the shares of A Ltd. is Rs. 95. The floatation costs are Rs. 5 per share amounts to Rs. 4.50 and is expected to grow at a rate of 7%. You are required to calculate the cost of equity share capital.

Solution

Market price Rs. 95

Dividend Rs. 4.50

Growth 7%.

$$K_e = \frac{D}{N_p} + g$$

$$= \frac{4.50}{95} \times 100 + 7\%$$

$$= 4.73\% + 7\% = 11.73\%$$

Earning Price Approach

Cost of equity determines the market price of the shares. It is based on the future earning prospects of the equity. The formula for calculating the cost of equity according to this approach is as follows.

$$\boxed{K_e = \frac{E}{N_p}}$$

Where,

K_e = Cost of equity capital

E = Earning per share

N_p = Net proceeds of an equity share

Exercise 4

A firm is considering an expenditure of Rs. 75 lakhs for expanding its operations. The relevant information is as follows :

Number of existing equity shares =10 lakhs

Market value of existing share =Rs.100

Net earnings =Rs.100 lakhs

Compute the cost of existing equity share capital and of new equity capital assuming that new shares will be issued at a price of Rs. 92 per share and the costs of new issue will be Rs. 2 per share.

Solution

Cost of existing equity share capital:

$$K_e = \frac{E}{N_p}$$

Earnings Per Share(EPS) $= \frac{100 \text{ lakhs}}{10 \text{ lakhs}} = Rs.10$

$$K_e = \frac{10}{100} \times 10$$

$$= 10\%$$

Cost of Equity Capital

$$K_e = \frac{E}{N_P}$$

$$= \frac{10}{92-2} \times 100$$

$$= 11.11\%$$

Realized Yield Approach

It is the easy method for calculating cost of equity capital. Under this method, cost of equity is calculated on the basis of return actually realized by the investor in a company on their equity capital.

$$\boxed{K_e = PVf \times D}$$

Where,

K_e = Cost of equity capital.

PVf = Present value of discount factor.

D = Dividend per share.

Cost of Debt

Cost of debt is the after tax cost of long-term funds through borrowing. Debt may be issued at par, at premium or at discount and also it may be perpetual or redeemable.

Debt Issued at Par

Debt issued at par means, debt is issued at the face value of the debt. It may be calculated with the help of the following formula.

$$K_d = (1 - t) R$$

Where,

K_d = Cost of debt capital

t = Tax rate

R = Debenture interest rate

Debt Issued at Premium or Discount

If the debt is issued at premium or discount, the cost of debt is calculated with the help of the following formula.

$$K_d = \frac{I}{N_p}(1 - t)$$

Where,

K_d = Cost of debt capital

I = Annual interest payable

N_p = Net proceeds of debenture

t = Tax rate

Exercise 5

(a) A Ltd. issues Rs. 10,00,000, 8% debentures at par. The tax rate applicable to the company is 50%. Compute the cost of debt capital.

(b) B Ltd. issues Rs. 1,00,000, 8% debentures at a premium of 10%. The tax rate applicable to the company is 60%. Compute the cost of debt capital.

(c) A Ltd. issues Rs. 1,00,000, 8% debentures at a discount of 5%. The tax rate is 60%, compute the cost of debt capital.

(d) B Ltd. issues Rs. 10,00,000, 9% debentures at a premium of 10%. The costs of floatation are 2%. The tax rate applicable is 50%. Compute the cost of debt-capital.

In all cases, we have computed the after-tax cost of debt as the firm saves on account of tax by using debt as a source of finance.

Solution

(a) $$K_{da} = \frac{I}{N_p}(1-t)$$

$$= \frac{8,000}{1,00,000} \times (1 - 0.5)$$

$$= \frac{8,000}{1,00,000} \times 0.5$$

$$= 4\%$$

$$K_{da} = \frac{I}{N_p}(1 - t)$$

(b) N_p = Face Value + Premium = 1,00,000+10,000=1,10,000

$$= \frac{8,000}{1,10,000} \times (1 - 0.6)$$

$$= \frac{8,000}{1,10,000} \times 0.6$$

$$= 2.91\%$$

(c) $$K_{da} = \frac{I}{N_p}(1 - t)$$

$$= \frac{8,000}{95,000} \times (1 - t)$$

$$= 3.37\%$$

(d) $$K_{da} = \frac{I}{N_p}(1 - t), N = \text{Rs. } (10,00,000 + 1,00,000) \times \frac{2}{100}$$

$$= \frac{90,000}{10,78,000} \times (1 - 0.5)$$

$$= 4.17\% = 11,00,000 - 22,000 = \text{Rs. } 10,78,000$$

Cost of Perpetual Debt and Redeemable Debt

It is the rate of return which the lenders expect. The debt carries a certain rate of interest.

$$K_{db} = \boxed{\frac{I + 1/n(P - N_p)n}{1/n(P + N_p)/2}}$$

Where,

I = Annual interest payable

P = Par value of debt

N_p = Net proceeds of the debenture

n = Number of years to maturity

K_{db} = Cost of debt before tax.

Cost of debt after tax can be calculated with the help of the following formula:

$$K_{da} = K_{db} \times (1-t)$$

Where,

K_{da} = Cost of debt after tax

K_{db} = Cost of debt before tax

t = Tax rate

Exercise 6

A company issues Rs. 20,00,000, 10% redeemable debentures at a discount of 5%. The costs of floatation amount to Rs. 50,000. The debentures are redeemable after 8 years. Calculate before tax and after tax. Cost of debt assuring a tax rate of 55%.

Solution

$$K_{db} = \frac{I = 1/n\,(P - N_p)}{1/2(P + N_p)}$$

$$= \frac{20,00,000 + 1/8(20,00,000 + 18,50,000)}{1/2(20,00,000 + 18,50,000)}$$

Note N_p = 20,00,000 – 10,00,000 – 50,000

$$= \frac{2,00,000 + 18750}{19,25,000}$$

$$= 11.36\%.$$

After Tax Cost of Debt K_{db}

$$= K_{da}\,(1 - t)$$

$$=11.36\,(1- 0.55)$$

$$=5.11\%.$$

Cost of Preference Share Capital

Cost of preference share capital is the annual preference share dividend by the net proceeds from the sale of preference share.

There are two types of preference shares irredeemable and redeemable. Cost of redeemable preference share capital is calculated with the help of the following formula:

$$K_p = \frac{D_p}{N_p}$$

Where,

K_p = Cost of preference share

D_p = Fixed preference dividend

N_p = Net proceeds of an equity share

Cost of irredeemable preference share is calculated with the help of the following formula:

$$K_p = \frac{D_p + (P - N_p)/n}{(P + N_p)/2}$$

Where,

K_p = Cost of preference share

D_p = Fixed preference share

P = Par value of debt

N_p = Net proceeds of the preference share

n = Number of maturity period.

Exercise 7

XYZ Ltd. issues 20,000, 8% preference shares of Rs. 100 each. Cost of issue is Rs. 2 per share. Calculate cost of preference share capital if these shares are issued (a) at par, (b) at a premium of 10% and (c) of a debentures of 6%.

Solution

Cost of preference share capital $K_p = \frac{D_p}{N_p}$

(a) $$K_p = \frac{1,60,000}{20,00,000 - 40,000} \times 100$$

$$= 8.16\%$$

(b) $$K_p = \frac{1,60,000}{2,00,000 - 40,000} \times 100$$

$$= 7.40\%$$

$$I\ K_p = \frac{1,60,000}{20,00,000 - 1,20,000 - 40,000} \times 100$$

$$= \frac{1,60,000}{18,40,000} \times 100$$

$$= 8.69\%$$

Exercise 8

ABC Ltd. issues 20,000, 8% preference shares of Rs. 100 each. Redeemable after 8 years at a premium of 10%. The cost of issue is Rs. 2 per share. Calculate the cost of preference share capital.

$$K_p = \frac{D_p + (P - N_p)/n}{(P + N_p)/2}$$

$$= \frac{1,60,000 + 1/8\ (22,00,000 - 19,60,000)}{1/\ 2(22,00,000 + 19,60,000)}$$

$$= \frac{1,60,000 + 30,000}{20,80,000}$$

$$= 9.13\%$$

where $D_p = 20,000 \times 100 \times 8\% = 1,60,000$

$P = 20,00,000 + 2,00,000 = 22,00,00$

$N_p = 20,00,000 - 40,000 = 19,60,000$

$n = 8$ years

Exercise 9

ABC Ltd. issues 20,000, 8% preference shares of Rs. 100 each at a premium of 5% redeemable after 8 years at par. The cost of issue is Rs. 2 per share. Calculate the cost of preference share capital.

Solution

$$K_p = \frac{D_p + (P - N_p)/n}{(P + N_p)/2}$$

$$= \frac{1,60,000 + 1/8\ (20,00,000 - 20,60,000)}{1/2\ (20,00,000 + 20,60,000)}$$

$$= \frac{1,60,000 - 7,500}{20,30,000}$$

$$= 7.51\%$$

where $D_p = 20,000 \times 100 \times 8\% = 1,60,000$

$P = 20,00,000$

$n = 8$ years

$N_p = 20,00,000 + 10,00,000 - 40,000 = 20,60,000$

Cost of Retained Earnings

Retained earnings is one of the sources of finance for investment proposal; it is different from other sources like debt, equity and preference shares. Cost of retained earnings is the same as the cost of an equivalent fully subscripted issue of additional shares, which is measured by the cost of equity capital. Cost of retained earnings can be calculated with the help of the following formula:

$$K_r = K_e\ (1 - t)\ (1 - b)$$

Where,

K_r = Cost of retained earnings

K_e = Cost of equity

t = Tax rate

b = Brokerage cost

Exercise 10

A firm's K_e (return available to shareholders) is 10%, the average tax rate of shareholders is 30% and it is expected that 2% is brokerage cost that shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

Solution

Cost of Retained Earnings, $K_r = K_e (1 - t) (1 - b)$

Where,

K_e = rate of return available to shareholders

t = tax rate

b = brokerage cost

So, $K_r = 10\% (1 - 0.5) (1 - 0.02)$

$= 10\% \times 0.5 \times 0.98$

$= 4.9\%$

Measurement of Overall Cost of Capital

It is also called as weighted average cost of capital and composite cost of capital. Weighted average cost of capital is the expected average future cost of funds over the long run found by weighting the cost of each specific type of capital by its proportion in the firms capital structure.

The computation of the overall cost of capital (K_o) involves the following steps.

(a) Assigning weights to specific costs.

(b) Multiplying the cost of each of the sources by the appropriate weights.

(c) Dividing the total weighted cost by the total weights.

The overall cost of capital can be calculated with the help of the following formula;

$$K_o = K_d W_d + K_p W_p + K_e W_e + K_r W_r$$

Where,

K_o = Overall cost of capital

K_d = Cost of debt

K_p = Cost of preference share

K_e = Cost of equity

K_r = Cost of retained earnings

W_d = Percentage of debt of total capital

W_p = Percentage of preference share to total capital

W_e = Percentage of equity to total capital

W_r = Percentage of retained earnings

Weighted average cost of capital is calculated in the following formula also:

$$K_w \frac{\Sigma XW}{\Sigma W}$$

Where,

K_w = Weighted average cost of capital

X = Cost of specific sources of finance

W = Weight, proportion of specific sources of finance.

Exercise 11

A firm has the following capital structure and after-tax costs for the different sources of funds used :

Source of Funds	Amount Rs.	Proportion %	After-tax cost %
Debt	12,000	20	4
Preference Shares	15,000	25	8
Equity Shares	18,000	30	12
Retained Earnings	15,000	25	11
Total	60,000	100	

You are required to compute the weighted average cost of capital.

Exercise 12

A company has on its books the following amounts and specific costs of each type of capital.

Type of Capital	Book Value Rs.	Market Value Rs.	Specific Costs (%)
Debt	4,00,000	3,80,000	5
Preference	1,00,000	1,10,000	8
Equity	6,00,000	9,00,000	15
Retained Earnings	2,00,000	3,00,000	13
	13,00,000	16,90,000	

Determine the weighted average cost of capital using:

(a) Book value weights, and

(b) Market value weights.

How are they different? Can you think of a situation where the weighted average cost of capital would be the same using either of the weights? **(MBA – P.U. Nov. 2005)**

Solution

Computation of Weighted Average Cost of Capital

A. Book Value

Source of Funds	Amount	Cost % (X)	Weighted Cost Proportion X Cost (XW)
Debt	4,00,000	5	20,000
Preference Shares	1,00,000	8	8,000
Equity Shares	6,00,000	15	90,000
Retained Earnings	2,00,000	13	26,000
	ΣW = 13,00,000		ΣXW = 1,44,000

$$K_w = \frac{\Sigma XW}{\Sigma W}$$

$$K_w = \frac{1,44,000}{13,00,000} \times 100 = 11.1\%$$

Computation Weighted Average Cost of Capital

B. Market Value

Source of Funds	Amount	Cost % (X)	Weighted Cost Proportion X Cost (XW)
Debt	3,80,000	5	19,000
Preference Shares	1,10,000	8	8,800
Equity Shares	9,00,000	15	13,500
Retained Earnings	3,00,000	13	39,000
	ΣW = 16,90,000		ΣXW = 2,01,800

$$K_w = \frac{\Sigma XW}{\Sigma W}$$

$$K_w = \frac{2,01,800}{16,90,000} \times 100 = 11.9\%$$

Exercise 13

ABC Ltd. has the following capital structure.

	Rs.
Equity (expected dividend 12%)	10,00,000
10% preference	5,00,000
8% loan	15,00,000

You are required to calculate the weighted average cost of capital, assuming 50% as the rate of income-tax, before and after tax.

Solution

Solution showing weighted average cost of capital:

Particulars	Rs.	After	Weights	Cost
Equity	10,00,000	12%	33.33%	3.99
Preference	5,00,000	10%	16.67	1.67
8% Loan	15,00,000	4%	50.00	2.00
				7.66%

Weight average cost of capital = 7.66%

MODEL QUESTIONS

1. What is cost of capital?
2. Define cost of capital.
3. Cost of capital computation based on certain assumptions. Discuss.
4. Explain the classification of cost.
5. Mention the importance of cost of capital.
6. Explain the computation of specific sources of cost of capital.
7. How over all cost of capital is calculated?
8. Explain various approaches for calculation of cost of equity.
9. Rama company issues 120000 10% debentures of Rs. 10 each at a premium of 10%. The costs of floatation are 4%. The rate of tax applicable to the company is 55%. Complete the cost of debt capital. (**Ans.** 4.26%)
10. Siva Ltd., issues 8000 8% debentures for Rs. 100 each at a discount of 5%. The commission payable to underwriters and brokers is Rs. 40000. The debentures are redeemable after 5 years. Compute the after tax cost of debt assuming a tax rate of 60%. (**Ans.** 3.69%)
11. Bharathi Ltd., issues 4000 12% preference shares of Rs. 100 each at a discount of 5%. Costs of raising capital are Rs. 8000. Compute the cost of preference capital. (**Ans.** 12.90%)

A firm's _____ is the mix of long-term debt and equity utilized by the firm, which may significantly affect its value by affecting return and risk.	capital structure
The inexpensive nature of long-term debt in a firm's capital structure is partly because _____.	the debt holders are the true owners of the firm
The inexpensive nature of long-term debt in a firm's capital structure is partly because _____.	equity capital has a fixed return
Which of the following is a basic source of capital for a firm?	current liabilities
A decrease in the use of financing that requires fixed payments will result in a(n)_____.	decrease in financial risk
As debt is substituted for equity in the capital structure and the debt ratio increases, the behavior of the overall cost of capital is partially explained by _____.	the decrease in the cost of equity
According to the pecking order theory, which of the following is the order in which corporations use different financing sources to fund investment projects?	debt, retained earnings, equity
_____ is the risk reflected in fluctuations of a firm's cash flows because it uses debt or other fixed-cost financing.	Systematic risk
____ is the risk that is reflected in fluctuations of the firm's cash flows before considering any debt financing.	Systematic risk
Which of the following is a difference between debt and equity capital?	Debt capital affects operating leverage, whereas equity capital affects financial leverage.
The _____ is a weighted average of the cost of funds which reflects the interrelationship of financing decisions.	internal rate of return
The _____ is the firm's desired optimal mix of debt and equity financing.	cost of capital
Although a firm's existing mix of financing sources may reflect its target capital structure, it is ultimately _____.	the internal rate of return that is relevant for evaluating the firm's future investment opportunities

The _____ is the rate of return required by the market suppliers of capital in order to attract their funds to the firm.	cost of capital
In order to recognize the interrelationship between financing and investments, a firm should use _____ when evaluating an investment.	the current opportunity cost
The four basic sources of long-term funds for a firm are _____.	current liabilities, long-term debt, common stock, and retained earnings
Which of the following is TRUE of long-term funds?	They are the funds available to a business on the basis of inventory held and require detailed inventory tracking.
Which of the following is a source of long-term funds?	money market instruments
A tax adjustment must be made in determining the cost of _____.	long-term debt
Debt is generally the least expensive source of capital. This is primarily due to _____.	debt's fixed interest payments and finite maturity
The cost of common stock equity is _____.	the historical cost of floating the stock issue
The cost of common stock equity may be estimated by using the _____.	Gordon model
The cost of common stock equity may be estimated by using the _____.	DuPont analysis
The cost of retained earnings is _____.	irrelevant to the investment/financing decision
A corporation that uses both debt and equity in its capital structure has concluded that the risk premium it must pay on its common stock is too high. To decrease this, the firm can _____.	increase the proportion of long-term debt to decrease the cost of capital
The constant-growth valuation model is based on the premise that the value of a share of common stock is _____.	determined by using a measure of relative risk called correlation coefficient
In calculating the cost of common stock equity, the model which describes the relationship between the required return and the nondiversifiable risk of the firm is _____.	the NPV model

A firm has a beta of 1.2. The market return equals 14 percent and the risk-free rate of return equals 6 percent. The estimated cost of common stock equity is _____.	7.2 percent
One major expense associated with issuing new shares of common stock is _____.	underpricing
One of the circumstances in which the Gordon growth valuation model for estimating the value of a share of stock should be used is _____.	a steady growth rate in dividends
Using the capital asset pricing model, the cost of common stock equity is the return required by investors as compensation for _____.	price volatility of the stock
The cost of new common stock financing is higher than the cost of retained earnings due to _____.	flotation costs and underpricing
Since retained earnings are viewed as a fully subscribed issue of additional common stock, the cost of retained earnings is _____.	equal to the cost of new common stock equity
When discussing weighing schemes for calculating the weighted average cost of capital, _____.	market value weights are preferred over book value weights and target weights are preferred over historical weights
The _____ is the rate of return required by the market suppliers of capital in order to attract their funds to the firm.	cost of capital
The cost of capital reflects the cost of funds	at a given point in time.
The firm's optimal mix of debt and equity is called its	maximum wealth.
The _____ is a weighted average of the cost of funds which reflects the interrelationship of financing decisions.	cost of capital
The _____ is the firm's desired optimal mix of debt and equity financing.	book value
The cost to a corporation of each type of capital is dependent upon	the risk-free rate of bonds plus the business risk of the firm.
The specific cost of each source of long-term financing is based on _____ and _____ costs.	before-tax; historical

In order to recognize the interrelationship between financing and investments, the firm should use _____ when evaluating an investment.	the current opportunity cost
The lower risk nature of long-term debt in a firm's capital structure is due to the fact that _____.	the debt holders are the true owners of the firm
Which of the following is a reason why equity capital is considered riskier than debt capital?	Equity capital expects dividend payments which are not tax-deductible.
The inexpensive nature of long-term debt in a firm's capital structure is partly because _____.	dividend payments are tax-deductible
The inexpensive nature of long-term debt in a firm's capital structure is partly because _____.	creditors have a higher position in the priority of claims
A single, overall cost of capital is often	it is the only way to measure a firm's
The cost of equity capital is all of the following EXCEPT:	the minimum rate that a firm should earn on the equity-financed part of an investment.
In calculating the proportional amount of equity financing employed by a firm, we should use:	the common stock equity account on the firm's balance sheet.
To compute the required rate of return for equity in a company using the CAPM, it is necessary to know all of the following EXCEPT:	the risk-free rate.
In calculating the costs of the individual components of a firm's financing, the corporate tax rate is important to which of the following component cost formulas?	common stock.
The common stock of a company must provide a higher expected return than the debt of the same company because	there is less demand for stock than for bonds.
A quick approximation of the typical firm's cost of equity may be calculated by	adding a 5 percent risk premium to the firm's before-tax cost of debt.
Market values are often used in computing the weighted average cost of capital because	this is the simplest way to do the calculation.
For an all-equity financed firm, a project whose expected rate of return plots _____ should be rejected.	above the characteristic line

Some projects that a firm accepts will undoubtedly result in zero or negative returns. In light of this fact, it is best if the firm	adjusts its hurdle rate (i.e., cost of capital) upward to compensate for this fact.
The Tchotchke Knick-Knack Company relies on preferred stock, bonds, and common stock for its long- term financing. Rank in ascending order (i.e., 1 = lowest, while 3 = highest) the likely after-tax component costs of the Tchotchke Company's long-term financing.	1 = bonds; 2 = common stock; 3 = preferred stock.
Lei-Feng, Inc.'s $100 par value preferred stock just paid its $10 per share annual dividend. The preferred stock has a current market price of $96 a share. The firm's marginal tax rate (combined federal and state) is 40 percent, and the firm plans to maintain its current capital structure relationship into the future. The component cost of preferred stock to Lei-Feng, Inc. would be closest to	6 percent
David Ding is evaluating two conventional, independent capital budgeting projects (X and Y) by making use of the risk-adjusted discount rate (RADR) method of analysis. Projects X and Y have internal rates of return of 16 percent and 12 percent, respectively. The RADR appropriate to Project X is 18 percent, while Project Y's RADR is only 10 percent. The company's overall, weighted-average cost of capital is 14 percent. David should	accept Project X and accept Project Y.
One way to visualize the RADR approach is to make (new) use of an "old friend," the	Security Market Line (SML)

capital budget	dividend policy
dividend payments are tax-deductible	long-term debt has a fixed return and a maturity date
the equity holders are the true owners of the firm	interest payments are tax-deductible
common stock	discounts from suppliers
increase in financial risk	decrease in operating leverage
the increase in the number of common shares outstanding	the tax-deductibility of interest payments
retained earnings, debt, equity	equity, retained earnings, debt
Diversifiable risk	Financial risk
Business risk	Diversifiable risk
Debt capital does not require periodic payments, whereas equity capital requires period payments.	Debt capital provides a tax shield, whereas equity capital does not provide a tax shield.
sunk cost	risk-free rate
book value	market value
the risk-free rate of return that is relevant for evaluating the firm's future investment opportunities	the marginal cost of capital that is relevant for evaluating the firm's future investment opportunities

yield to maturity	modified internal rate of return
the weighted average cost of all financing sources	the least costly source of financing
long-term debt, common stock, preferred stock, and retained earnings	long-term debt, paid-in capital in excess of par, common stock, and retained earnings
They are a type of investment fund which invests in money market investments of high quality and low risk.	They are the sources that supply the financing necessary to support a firm's capital budgeting activities.
commercial paper	factoring
common stock	retained earnings
the secured nature of a debt obligation	the tax deductibility of dividends paid to shareholders
the rate at which investors discount the expected dividends of the firm to determine its share value	the after-tax cost of the interest obligations
DuPont analysis	yield curve
break-even analysis	capital asset pricing model
equal to the cost of a new issue of common stock	equal to the cost of common stock equity
increase the proportion of common stock equity to decrease financial risk	increase the proportion of short-term debt to decrease the cost of capital
equal to the present value of all expected future dividends	the sum of the dividends and expected capital appreciation
the constant-growth model	the capital asset pricing model

6 percent	15.6 percent
coupon payment	overvaluation
an erratic dividend stream	the lack of data on dividend payments
the specific risk of a firm	a firm's unsystematic risk
commission costs and overpricing	flotation costs and overpricing
greater than the cost of new common stock equity	less than the cost of new common stock equity
market value weights are preferred over book value weights and historical weights are preferred over target weights	book value weights are preferred over market value weights and historical weights are preferred over target weights
internal rate of return	gross profit margin
over a short-run time period.	at current book values.
maximum book value.	optimal ratio.
risk-free rate	risk premium
cost of capital	market value
the risk-free rate of each type of capital plus the business risk and the financial risk of the firm.	the risk-free rate of each type of capital plus the business risk of the firm.
before-tax; book value	after-tax; current

the weighted average cost of all financing sources	the least costly source of financing
equity capital has a fixed return	dividend payments are tax-deductible
Equity capital requires regular periodic payments in the form of dividends.	Equity capital has a higher priority claim against assets and earnings.
long-term debt has a fixed return and a maturity date	the debt holders are the true owners of the firm
dividend payments are tax-deductible	equity capital has a fixed return
it acknowledges that most new	it acknowledges that most new
a return on the equity-financed portion of an investment that, at worst, leaves the market price of the stock unchanged.	by far the most difficult component cost to estimate.
the sum of common stock and preferred stock on the balance sheet.	the book value of the firm.
the beta for the firm.	the earnings for the next time period.
debt.	preferred stock.
there is greater demand for stock than for bonds.	there is more systematic risk involved for the common stock.
adding a 5 percent risk premium to the firm's after-tax cost of debt.	subtracting a 5 percent risk discount from the firm's before-tax cost of debt.
this is consistent with the goal of maximizing shareholder value.	this is required in the U.S. by the Securities and Exchange Commission.
above the security market line	below the security market line

adjusts its hurdle rate (i.e., cost of capital) downward to compensate for this fact.	does not adjust its hurdle rate up or down regardless of this fact.
1 = bonds; 2 = preferred stock; 3 = common stock.	1 = common stock; 2 = preferred stock; 3 = bonds.
6.25 percent	10 percent
accept Project X and reject Project Y.	reject Project X and accept Project Y.
characteristic line	NPV profile

working capital	**capital structure**
equity capital has a fixed return	**long-term debt has a fixed return and a maturity date**
equity holders have a higher position in the priority of claims	**interest payments are tax-deductible**
short-term debt	**common stock**
increase in operating leverage	**decrease in financial risk**
the reduction in risk as perceived by the common shareholders	**the tax-deductibility of interest payments**
retained earnings, equity, debt	**retained earnings, debt, equity**
Business risk	**Financial risk**
Financial risk	**Business risk**
Debt capital requires returns in proportion to profits, whereas equity capital requires a fixed rate of return.	**Debt capital provides a tax shield, whereas equity capital does not provide a tax shield.**
cost of capital	**cost of capital**
target capital structure	**target capital structure**
the risk-free rate of return that is relevant for evaluating the firm's future financing opportunities	**the marginal cost of capital that is relevant for evaluating the firm's future investment opportunities**

internal rate of return	**cost of capital**
the most costly source of financing	**the weighted average cost of all financing sources**
current liabilities, long-term debt, common stock, and preferred stock	**long-term debt, common stock, preferred stock, and retained earnings**
They provide an easy way to reduce financing costs because they are relatively cheaper than short-term funds.	**They are the sources that supply the financing necessary to support a firm's capital budgeting activities.**
retained earnings	**retained earnings**
preferred stock	**long-term debt**
debt being less risky than equity and interest payments being tax deductible	**debt being less risky than equity and interest payments being tax deductible**
the cost of the guaranteed stated dividend expected by the stockholders	**the rate at which investors discount the expected dividends of the firm to determine its share value**
break-even analysis	**Gordon model**
yield curve	**capital asset pricing model**
less than the cost of debt	**equal to the cost of common stock equity**
decrease the proportion of common stock equity to decrease financial risk	**increase the proportion of common stock equity to decrease financial risk**
determined based on an industry standard P/E multiple	**equal to the present value of all expected future dividends**
the variable growth model	**the capital asset pricing model**

14 percent	**15.6 percent**
sunk cost	**underpricing**
declining dividends	**a steady growth rate in dividends**
a firm's nondiversifiable risk	**a firm's nondiversifiable risk**
flotation costs and commission costs	**flotation costs and underpricing**
not related to the cost of new common stock equity	**less than the cost of new common stock equity**
book value weights are preferred over market value weights and target weights are preferred over historical weights	**market value weights are preferred over book value weights and target weights are preferred over historical weights**
yield to maturity	**cost of capital**
over a long-run time period.	**over a long-run time period.**
target capital structure.	**target capital structure.**
nominal cost	**cost of capital**
target capital structure	**target capital structure**
the risk-free rate of each type of capital plus the financial risk of the firm.	**the risk-free rate of each type of capital plus the business risk and the financial risk of the firm.**
after-tax; historical	**after-tax; current**

the most costly source of financing	**the weighted average cost of all financing sources**
creditors have a higher position in the priority of claims	**creditors have a higher position in the priority of claims**
Equity capital remains invested in a firm indefinitely.	**Equity capital remains invested in a firm indefinitely.**
equity capital has a fixed return	**long-term debt has a fixed return and a maturity date**
the equity holders are the true owners of the firm	**creditors have a higher position in the priority of claims**
it avoids the problem of	**it avoids the problem of**
generally lower than the before-tax cost of debt.	**generally lower than the before-tax cost of debt.**
the current market price per share of common stock times the number of shares outstanding.	**the current market price per share of common stock times the number of shares outstanding.**
the market return expected for the time period.	**the earnings for the next time period.**
Shares.	**debt.**
there is a market premium required for bonds.	**there is more systematic risk involved for the common stock.**
subtracting a 5 percent risk discount from the firm's after-tax cost of debt.	**adding a 5 percent risk premium to the firm's before-tax cost of debt.**
this is a very common mistake.	**this is consistent with the goal of maximizing shareholder value.**
below the characteristic line	**below the security market line**

raises its prices to compensate for this fact.	**does not adjust its hurdle rate up or down regardless of this fact.**
1 = preferred stock; 2 = common stock; 3 = bonds.	**1 = bonds; 2 = preferred stock; 3 = common stock.**
10.4 percent	**10.4 percent**
reject Project X and reject Project Y.	**reject Project X and accept Project Y.**
Investment Profile	**NPV profile**

Chapter 7 Leverage

INTRODUCTION

Financial decision is one of the integral and important parts of financial management in any kind of business concern. A sound financial decision must consider the board coverage of the financial mix (Capital Structure), total amount of capital (capitalization) and cost of capital (K_o). Capital structure is one of the significant things for the management, since it influences the debt equity mix of the business concern, which affects the shareholder's return and risk. Hence, deciding the debt-equity mix plays a major role in the part of the value of the company and market value of the shares. The debt equity mix of the company can be examined with the help of leverage.

The concept of leverage is discussed in this part. Types and effects of leverage is discussed in the part of EBIT and EPS.

Meaning of Leverage

The term leverage refers to an increased means of accomplishing some purpose. Leverage is used to lifting heavy objects, which may not be otherwise possible. In the financial point of view, leverage refers to furnish the ability to use fixed cost assets or funds to increase the return to its shareholders.

Definition of Leverage

James Horne has defined leverage as, "the employment of an asset or fund for which the firm pays a fixed cost or fixed return.

Types of Leverage

Leverage can be classified into three major headings according to the nature of the finance mix of the company.

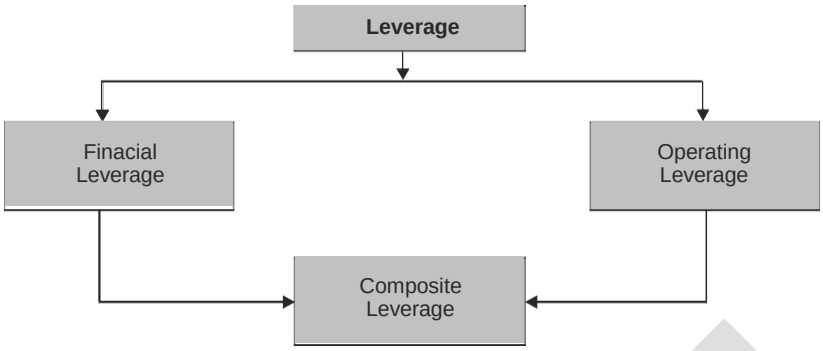


Fig. 7.1 *Types of Leverage*

The company may use finance or leverage or operating leverage, to increase the EBIT and EPS.

OPERATING LEVERAGE

The leverage associated with investment activities is called as operating leverage. It is caused due to fixed operating expenses in the company. Operating leverage may be defined as the company's ability to use fixed operating costs to magnify the effects of changes in sales on its earnings before interest and taxes. Operating leverage consists of two important costs viz., fixed cost and variable cost. When the company is said to have a high degree of operating leverage if it employs a great amount of fixed cost and smaller amount of variable cost. Thus, the degree of operating leverage depends upon the amount of various cost structure. Operating leverage can be determined with the help of a break even analysis.

Operating leverage can be calculated with the help of the following formula:

$$OL = \frac{C}{OP}$$

Where,

OL = Operating Leverage

C = Contribution

OP = Operating Profits

Degree of Operating Leverage

The degree of operating leverage may be defined as percentage change in the profits resulting from a percentage change in the sales. It can be calculated with the help of the following formula:

$$DOL = \frac{\text{Percentage change in profits}}{\text{Percentage change insales}}$$

Exercise 1

From the following selected operating data, determine the degree of operating leverage. Which company has the greater amount of business risk? Why?

	Company A Rs.	Company B Rs.
Sales	25,00,000	30,00,000
Fixed costs	7,50,000	15,00,000

Variable expenses as a percentage of sales are 50% for company A and 25% for company B.

Solution

Statement of Profit

	Company A Rs.	Company B Rs.
Sales	25,00,000	30,00,000
Variable cost	12,50,000	7,50,000
Contribution	12,50,000	22,50,000
Fixed cost	7,50,000	15,00,000
Operating Profit	5,00,000	7,50,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Operating Profit}}$$

"A" $$\text{Company Leverage} = \frac{12,50,000}{5,00,000} = 2.5$$

"B" $$\text{Company Leverage} = \frac{2,25,000}{7,50,000} = 3$$

Comments

Operating leverage for B Company is higher than that of A Company; B Company has a higher degree of operating risk. The tendency of operating profit may vary portionately with sales, is higher for B Company as compared to A Company.

Uses of Operating Leverage

Operating leverage is one of the techniques to measure the impact of changes in sales which lead for change in the profits of the company.

If any change in the sales, it will lead to corresponding changes in profit.

Operating leverage helps to identify the position of fixed cost and variable cost.

Operating leverage measures the relationship between the sales and revenue of the company during a particular period.

Operating leverage helps to understand the level of fixed cost which is invested in the operating expenses of business activities.

Operating leverage describes the over all position of the fixed operating cost.

FINANCIAL LEVERAGE

Leverage activities with financing activities is called financial leverage. Financial leverage represents the relationship between the company's earnings before interest and taxes (EBIT) or operating profit and the earning available to equity shareholders.

Financial leverage is defined as "the ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the earnings per share". It involves the use of funds obtained at a fixed cost in the hope of increasing the return to the shareholders. "The use of long-term fixed interest bearing debt and preference share capital along with share capital is called financial leverage or trading on equity".

Financial leverage may be favourable or unfavourable depends upon the use of fixed cost funds.

Favourable financial leverage occurs when the company earns more on the assets purchased with the funds, then the fixed cost of their use. Hence, it is also called as positive financial leverage.

Unfavourable financial leverage occurs when the company does not earn as much as the funds cost. Hence, it is also called as negative financial leverage.

Financial leverage can be calculated with the help of the following formula:

$$FL = \frac{OP}{PBT}$$

Where,

FL = Financial leverage

OP = Operating profit (EBIT)

PBT = Profit before tax.

Degree of Financial Leverage

Degree of financial leverage may be defined as the percentage change in taxable profit as a result of percentage change in earning before interest and tax (EBIT). This can be calculated by the following formula

$$DFL = \frac{\text{Percentage change in taxable Income}}{\text{Precentage change in EBIT}}$$

Alternative Definition of Financial Leverage

According to **Gitmar**, "financial leverage is the ability of a firm to use fixed financial changes to magnify the effects of change in EBIT and EPS".

$$FL = \frac{EBIT}{EPS}$$

Where,

FL = Financial Leverage

EBIT = Earning Before Interest and Tax

EPS = Earning Per share.

Exercise 2

A Company has the following capital structure.

	Rs.
Equity share capital	1,00,000
10% Prof. share capital	1,00,000
8% Debentures	1,25,000

The present EBIT is Rs. 50,000. Calculate the financial leverage assuring that the company is in 50% tax bracket.

Solution

Statement of Profit	Rs.
Earning Before Interest and Tax (EBIT) (or) Operating Profit	50,000
Interest on Debenture 1,25,000 × 8 × 100	10,000
Earning before Tax (EBT)	40,000
Income Tax	20,000
Profit	20,000

$$\text{Financial leverage} = \frac{\text{Operating Profit (OP)}}{\text{Profit Before Tax (PBT)}}$$

$$= \frac{50,000}{40,000} = 1.25$$

Uses of Financial Leverage

Financial leverage helps to examine the relationship between EBIT and EPS.

Financial leverage measures the percentage of change in taxable income to the percentage change in EBIT.

Financial leverage locates the correct profitable financial decision regarding capital structure of the company.

Financial leverage is one of the important devices which is used to measure the fixed cost proportion with the total capital of the company.

If the firm acquires fixed cost funds at a higher cost, then the earnings from those assets, the earning per share and return on equity capital will decrease.

The impact of financial leverage can be understood with the help of the following exercise.

Exercise 3

XYZ Ltd. decides to use two financial plans and they need Rs. 50,000 for total investment.

Particulars	Plan A	Plan B
Debenture (interest at 10%)	40,000	10,000
Equity share (Rs. 10 each)	10,000	40,000
Total investment needed	50,000	50,000
Number of equity shares	4,000	1,000

The earnings before interest and tax are assumed at Rs. 5,000, and 12,500. The tax rate is 50%. Calculate the EPS.

Solution

When EBIT is Rs. 5,000

Particulars	Plan A	Plan B
Earnings before interest and tax (EBIT)	5,000	5,000
Less : Interest on debt (10%)	4,000	1,000
Earnings before tax (EBT)	1,000	4,000
Less : Tax at 50%	500	2,000
Earnings available to equity shareholders.	Rs.500	Rs.2,000
No. of equity shares	1,000	4,000
Earnings per share (EPS)	Rs. 0.50	Rs. 0.50
Earnings/No. of equity shares		

When EBIT is Rs. 12,500

Particulars	Plan A	Plan B
Earnings before interest and tax (EBIT).	12,500	12,500
Less: Interest on debt (10%)	4,000	1,000

(Contd. ..)

Earning before tax (EBT)	8,500	11,500
Less : Tax at 50%	4,250	5,750
Earnings available to equity shareholders	4,250	5,750
No. of equity shares	1,000	4,000
Earning per share	4.25	1.44

DISTINGUISH BETWEEN OPERATING LEVERAGE AND FINANCIAL LEVERAGE

Operating Leverage/Financial Leverage

Operating Leverage	Financial Leverage
1. Operating leverage is associated with investment activities of the company.	1. Financial leverage is associated with financing activities of the company.
2. Operating leverage consists of fixed operating expenses of the company.	2. Financial leverage consists of operating profit of the company.
3. It represents the ability to use fixed operating cost.	3. It represents the relationship between EBIT and EPS.
4. Operating leverage can be calculated by $OL = \frac{C}{OP}$.	4. Financial leverage can be calculated by $FL = \frac{OP}{PBT}$.
5. A percentage change in the profits resulting from a percentage change in the sales is called as degree of operating leverage.	5. A percentage change in taxable profit is the result of percentage change in EBIT.
6. Trading on equity is not possible while the company is operating leverage.	6. Trading on equity is possible only when the company uses financial leverage.
7. Operating leverage depends upon fixed cost and variable cost.	7. Financial leverage depends upon the operating profits.
8. Tax rate and interest rate will not affect the operating leverage.	8. Financial leverage will change due to tax rate and interest rate.

EBIT - EPS Break even chart for three different financing alternatives

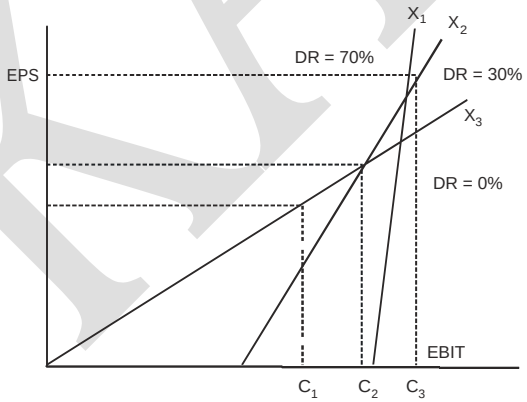


***Fig. 7.2** EBIT - EPS Break Even Chart*

Where,

DR= Debt Ratio

C_1, C_2, C_3 = Indifference Point

X_1, X_2, X_3 = Financial BEP

Financial BEP

It is the level of EBIT which covers all fixed financing costs of the company. It is the level of EBIT at which EPS is zero.

Indifference Point

It is the point at which different sets of debt ratios (percentage of debt to total capital employed in the company) gives the same EPS.

COMBINED LEVERAGE

When the company uses both financial and operating leverage to magnification of any change in sales into a larger relative changes in earning per share. Combined leverage is also called as composite leverage or total leverage.

Combined leverage express the relationship between the revenue in the account of sales and the taxable income.

Combined leverage can be calculated with the help of the following formulas:

$$CL = OL \times FL$$

$$CL = \frac{C}{OP} \times \frac{OP}{PBT} = \frac{C}{PBT}$$

Where,

CL = Combined Leverage

OL = Operating Leverage

FL = Financial Leverage

C = Contribution

OP = Operating Profit (EBIT)

PBT = Profit Before Tax

Degree of Combined Leverage

The percentage change in a firm's earning per share (EPS) results from one percent change in sales. This is also equal to the firm's degree of operating leverage (DOL) times its degree of financial leverage (DFL) at a particular level of sales.

$$\text{Degree of contributed coverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in sales}}$$

Exercise 4

Kumar company has sales of Rs. 25,00,000. Variable cost of Rs. 12,50,000 and fixed cost of Rs. 50,000 and debt of Rs. 12,50,000 at 8% rate of interest. Calculate combined leverage.

Solution

Statement of Profit

Sales		25,00,000
Less:	Variable cost	15,00,000
	Contribution	10,00,000
Less:	Fixed cost	5,00,000
	Operating Profit	5,00,000

Combined leverage =Operating leverage×Financial leverage

Calculation of financial leverage

$$\frac{\text{Contribution}}{\text{Operating Profit}} = \frac{10,00,000}{5,00,000} = 2$$

Calculation of financial leverage

Earning before Interest and Tax (EBIT)	5,00,000
Less: Interest on Debenture (8% of 12,50,000)	1,00,000
Earnings before Tax	4,00,000

$$\text{Operating leverage} = \frac{\text{Operating Profit}}{\text{Earning Before Tax}} = \frac{5,00,000}{4,00,000} = 1.25$$

$$\text{Combined leverage} = 2 \times 1.25 = 2.5$$

Exercise 5

Calculate the operating, financial and combined leverage under situations 1 and 2 and the financial plans for X and Y respectively from the following information relating to the operating and capital structure of a company, and also find out which gives the highest and the least value ? Installed capacity is 5000 units. Annual Production and sales at 60% of installed capacity.

Selling price per unit Rs. 25

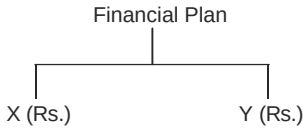
Variable cost per unit Rs. 15

Fixed cost:

Situation 1 : Rs. 10,000

Situation 2 : Rs. 12,000

Capital structure:



Equity	25,000	50,000
Debt (cost 10%)	50,000	25,000
	75,000	75,000

Solution

Annual production and sales 60% of 5,000 = 3000 Unit

Contribution per Unit	Rs.
Selling Price	25 Per Unit
Variable Price	15 Per Unit
	10 Per Unit

Total contribution is 3000 Units×Rs. 10=Rs. 30,000

Computation of leverage.

Financial plan

	PLAN-X		PLAN-Y	
	Situation 1	**Situation 2**	**Situation 1**	**Situation 2**
Contribution	30000	30000	30000	30000
Fixed cost operating profit (or) EBIT	10000	12000	10000	12000
	20000	18000	20000	18000
Interest on Debts 10% of 50,000 10% of 25,000	5000	5000	2500	2500
Earnings before Tax	15000	13000	17500	15500
(i) Operating Leverage				
Contribution	30000	30000	30000	30000
	20000	18000	20000	18000
	= 1.5	1.67	1.5	1.67
(ii) Financial Leverage				
Operating Profit (op)	20000	18000	20000	18000
Profit Before Tax (PBI)	15000	13000	17500	15500
(iii) Combined leverage				
OL × FL =	1.5 × 1.33	1.67 × 1.38	1.5 × 1.14	1.67 × 1.16
	1.995	2.30	1.71	1.94

Highest and least value of combined leverage.

Highest Value = 2.30 under situation 2 plan X.

Least Value = 1.71 under situation 1 plan Y.

Exercise 6

Calculate operating, financial and combined leverages under situations when fixed costs are:

(i) Rs. 5,000 and

(ii) Rs. 10,000 and financial plans 1 and 2 respectively from the following information pertaining to the operating and capital structure of a textile company :

	Rs.
Total Assets	30,000
Total Assets turnover	2
Variable cost as percentage of sales	60

Capital structure	**Financial Plan**	
	1	2
	Rs.	Rs.
Equity	30,000	10,000
10% debentures	10,000	30,000

Solution

Computation of Leverage

Financial Plan

Plan	**1**		**2**	
Situation	**i**	**ii**	**i**	**ii**
Sales	60,000	60,000	60,000	60,000
Less : Variable cost	36,000	36,000	36,000	36,000
Contribution	24,000	24,000	24,000	24,000
Less : Fixed cost	5,000	10,000	5,000	10,000
Operating profit (EBIT)	19,000	14,000	19,000	14,000
Less : Interest	1,000	1,000	3,000	3,000
Profit before tax (PBT)	18,000	13,000	16,000	11,000
Operating leverage	24,000	24,000	24,000	24,000
Contribution	19,000	14,000	19,000	14,000
EBIT	1.26	1.71	1.26	1.71
Financial leverage	19,000	14,000	19,000	14,000
EBIT	18,000	13,000	16,000	11,000
PBT	1.05	1.07	1.18	1.27
Combined leverage	1.32	1.83	1.49	2.17

WORKING CAPITAL LEVERAGE

One of the new models of leverage is working capital leverage which is used to locate the investment in working capital or current assets in the company.

Working capital leverage measures the sensitivity of return in investment of charges in the level of current assets.

$$\text{WCL} = \frac{\text{Percentage Change in ROI}}{\text{Percentage Change is WC}}$$

If the earnings are not affected by the changes in current assets, the working capital leverage can be calculated with the help of the following formula.

$$\text{WCL} = \frac{\text{CA}}{\text{TA} \pm \text{DCA}}$$

Where,

CA = Current Assets

TA = Total Assets

DCA = Changes in the level of Current Assets

Exercise 7

The following information is available for two companies.

	X Ltd.	Y Ltd.
Fixed Assets	Rs. 4,00,000	1,00,000
Current Assets	Rs. 10,00,000	4,00,000
Total Assets	Rs. 14,00,000	14,00,000
Earning before interest and taxes	Rs. 1,50,000	1,50,000

You are required to compare the sensitivity earnings of the two companies for 30% charge in the level of their current assets.

Solution

$$\text{Working capital leverage} = \frac{\text{Current Assets}}{\text{Total Assets} \pm \text{DCA}}$$

$$\text{X Ltd.} = \frac{1,00,000}{14,00,000 - 3,00,000}$$

$$= \frac{10,00,000}{11,00,000}$$

$$= 0.90$$

$$\text{Y Ltd.} = \frac{4,00,000}{14,00,000 - 1,20,000}$$

$$= \frac{4,00,000}{12,80,000}$$

$$= 0.3125$$

Looking at the working capital leverage of the two companies, we can say that the sensitivity of earnings for charge on the level of current assets of X Ltd. is a greater than of Y Ltd.

Exercise 8

Calculate operating leverage and financial leverage under situations A, B and C and financial plans 1, 2 and 3 respectively from the following information relating to the operating and financial leverage which give the highest value and the least value.

Installed capacity (units)	1,200
Actual production and sales (units)	800
Selling price per unit (Rs.)	15
Variable cost per unit (Rs.)	10
Fixed costs (Rs.) Situation A	1,000
Situation B	2,000
Situation C	3,000

Capital Structure	**Financial Plan**		
	1	2	3
Equity	Rs. 5,000	Rs. 7,500	Rs. 2,500
Debt	Rs. 5,000	Rs. 2,500	Rs. 7,500
Cost of debt (for all plans)		12 per cent	

(MBA – P.U. Nov. 2005)

Solution

	A	B	C
S – VC	4,000	4,000	4,000
EBIT	3,000	2,000	1,000
$DOL = \frac{S - VC}{EBIT}$	1.33	2	4
	1	2	3

Situation A

EBIT	3,000	3,000	3,000
Less : Interest	600	300	900
EBT	2,400	2,700	2,100
Financial Leverage	1.25	1.11	1.43

Situation B

EBIT	2,000	2,000	2,000
Less : Interest	600	300	900

EBT	1,400	1,700	1,100
Financial Leverage	1.43	1.18	1.82

Situation C

EBIT	1,000	1,000	1,000
Less : Interest	600	300	900
EBT–I	400	700	100
Financial Leverage	2.5	1.43	10

Exercise 9

' XYZ' company has a choice of the following three financial plans. You are required to calculate the financial leverage in each case.

	Plan I	**Plan II**	**Plan III**
Equity capital	Rs. 2,000	Rs. 1,000	Rs. 3,000
Debt	Rs. 2,000	Rs. 3,000	Rs. 1,000
EBIT	Rs. 400	Rs. 400	Rs. 400

Interest @10% per annum on debts in all cases.

Solution

	Plan I	**Plan II**	**Plan III**
	Rs.	Rs.	Rs.
EBIT	400	400	400
Less Interest-(I)	200	300	100
EBIT–I	200	100	300
FL	2	4	1.33

MODEL QUESTIONS

1. Write a note on trading on equity.
2. What is meant by working capital leverage?
3. What is leverage? Mention different types of leverage?
4. Explain the operating leverage.
5. Discuss the concept of financial leverage.
6. How compared leverage is calculated?
7. Explain the working capital leverage.

Chapter

8

Dividend Decision

INTRODUCTION

The financial manager must take careful decisions on how the profit should be distributed among shareholders. It is very important and crucial part of the business concern, because these decisions are directly related with the value of the business concern and shareholder's wealth. Like financing decision and investment decision, dividend decision is also a major part of the financial manager. When the business concerns decide dividend policy, they have to consider certain factors such as retained earnings and the nature of shareholder of the business concern.

Meaning of Dividend

Dividend refers to the business concerns net profits distributed among the shareholders. It may also be termed as the part of the profit of a business concern, which is distributed among its shareholders.

According to the **Institute of Chartered Accountant of India**, dividend is defined as "a distribution to shareholders out of profits or reserves available for this purpose".

TYPES OF DIVIDEND/ FORM OF DIVIDEND

Dividend may be distributed among the shareholders in the form of cash or stock. Hence, Dividends are classified into:

A. Cash dividend
B. Stock dividend
C. Bond dividend
D. Property dividend

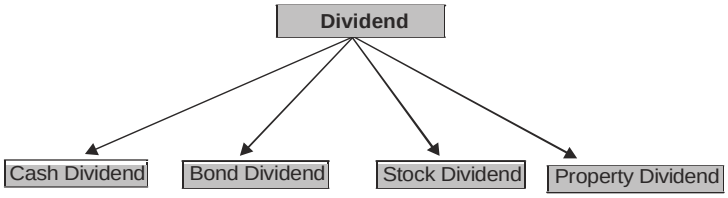


Fig. 8.1 *Types of Dividend*

Cash Dividend

If the dividend is paid in the form of cash to the shareholders, it is called cash dividend. It is paid periodically out the business concerns EAIT (Earnings after interest and tax). Cash dividends are common and popular types followed by majority of the business concerns.

Stock Dividend

Stock dividend is paid in the form of the company stock due to raising of more finance. Under this type, cash is retained by the business concern. Stock dividend may be bonus issue. This issue is given only to the existing shareholders of the business concern.

Bond Dividend

Bond dividend is also known as script dividend. If the company does not have sufficient funds to pay cash dividend, the company promises to pay the shareholder at a future specific date with the help of issue of bond or notes.

Property Dividend

Property dividends are paid in the form of some assets other than cash. It will distributed under the exceptional circumstance. This type of dividend is not published in India.

DIVIDEND DECISION

Dividend decision of the business concern is one of the crucial parts of the financial manager, because it determines the amount of profit to be distributed among shareholders and amount of profit to be treated as retained earnings for financing its long term growth. Hence, dividend decision plays very important part in the financial management.

Dividend decision consists of two important concepts which are based on the relationship between dividend decision and value of the firm.

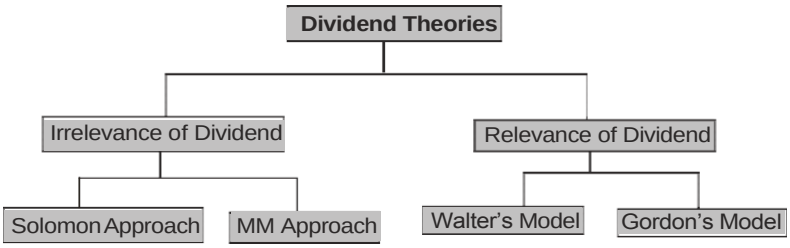


Fig. 8.2 *Dividend Theories*

Irrelevance of Dividend

According to professors **Soloman, Modigliani and Miller**, dividend policy has no effect on the share price of the company. There is no relation between the dividend rate and value of the firm. Dividend decision is irrelevant of the value of the firm. Modigliani and Miller contributed a major approach to prove the irrelevance dividend concept.

Modigliani and Miller's Approach

According to MM, under a perfect market condition, the dividend policy of the company is irrelevant and it does not affect the value of the firm.

"Under conditions of perfect market, rational investors, absence of tax discrimination between dividend income and capital appreciation, given the firm's investment policy, its dividend policy may have no influence on the market price of shares".

Assumptions

MM approach is based on the following important assumptions:

1. Perfect capital market.
2. Investors are rational.
3. There are no tax.
4. The firm has fixed investment policy.
5. No risk or uncertainty.

Proof for MM approach

MM approach can be proved with the help of the following formula:

$$P_o = \frac{D_1 + P_1}{(1 + W_e)}$$

Where,

P_o = Prevailing market price of a share.

K_e = Cost of equity capital.

D_1 = Dividend to be received at the end of period one.

P_1 = Market price of the share at the end of period one.

P_1 can be calculated with the help of the following formula.

$$P_1 = P_o (1+K_e) - D_1$$

The number of new shares to be issued can be determined by the following formula:

$$M \times P_1 = I - (X - nD_1)$$

Where,

M = Number of new share to be issued.

P_1 = Price at which new issue is to be made.

I = Amount of investment required.

X = Total net profit of the firm during the period.

nD_1= Total dividend paid during the period.

Exercise 1

X Company Ltd., has 100000 shares outstanding the current market price of the shares Rs. 15 each. The company expects the net profit of Rs. 2,00,000 during the year and it belongs to a rich class for which the appropriate capitalisation rate has been estimated to be 20%. The company is considering dividend of Rs. 2.50 per share for the current year.

What will be the price of the share at the end of the year (i) if the dividend is paid and (ii) if the dividend is not paid.

Solution

$$P_o = \frac{D_1 + P_1}{(1 + W_e)}$$

(i) If the dividend is paid

$P_o = Rs.15$

$K_e = 20\%$

$D_1 = 2.50$

$P_1 = ?$

$$15 = \frac{Z.50 + P_1}{1 + Z0\%}$$

$$15 = \frac{Z.50 + P_1}{1.Z}$$

$2.50 + P_1 = 15 \times 1.2$

$P_1 = 18 - 2.50$

$P_1 = Rs.\ 15.50$

(ii) If the dividend is not paid

$P_o = 15$

$K_e = 20\%$

$D_1 = 0$

$$P_1 = ?$$

$$15 = \frac{0 + P_1}{1 + Z0\%}$$

$$15 = \frac{0 + P_1}{1.Z\,0}$$

$$0 + P_1 = 15 \times 1.20$$

$$P_1 = \text{Rs. } 18.$$

Exercise 2

Ram company belongs to a risk class for which the appropriate capitalization rate is 12%. It currently has outstanding 30000 shares selling at Rs. 100 each. The firm is contemplating the declaration of dividend of Rs. 6 per share at the end of the current financial year. The company expects to have a net income of Rs. 3,00,000 and a proposal for making new investments of Rs. 6,00,000. Show that under the MM assumptions, the payment of dividend does not affect the value of the firm. How many new shares issued and what is the market value at the end of the year?

Solution

$$P_o = \frac{D_1 + P_1}{1 + W_e}$$

$$P_o = 100$$

$$D_1 = \text{Rs. } 6$$

$$P_1 = ?$$

$$K_e = 12\%$$

$$100 = \frac{6 + P_1}{1 + 1Z\mathbf{f}}$$

$$100 = \frac{6 + P}{Z}$$

$$6 + P_1 = 112$$

$$P_1 = 112 - 6$$

$$P_1 = \text{Rs. } 106$$

Dividend is not declared

$K_e = 12\%$, $P_o = 100$, $D_1 = 0$, $P_1 = ?$

$$100 = \frac{0 + P_1}{1 + 1Z\%}$$

$$100 = \frac{0 + P_1}{Z}$$

$$P_1 = \text{Rs. } 112$$

Calculation of number of new shares to be issued

	Dividends Paid	Dividends not Paid
Net Income	300000	300000
Total Dividends	180000	–
Retained Earnings	120000	300000
Investment Budget	600000	600000
Amount to be raised as new shares (Investment – Retained Earnings)	480000	300000
Relevant – Market Price per share	Rs. 106	Rs. 112
No. of new shares to be issued	4528.3	2678.6
Total number of shares at the end of the year	300000	30000
Existing shares	4528.3	2678.6
(+) new shares issued	34528.3	32678.6
Market price per share	**Rs. 106**	**112**
Market value for shares	**Rs. 3660000**	**3660000**

There is no change in the total market value of shares whether dividends are distributed or not distributed.

Exercise 3

ABC Ltd. has a capital of Rs. 10,00,000 in equity shares of Rs. 100 each. The shares are currently quoted at par. The company proposes to declare a dividend of Rs. 10 per share at the end of the current financial year. The capitalization rate for the risk class to which the company belongs is 12%.

What will be the MP of the share at the end of the year, if

(i) A dividend is not declared.

(ii) A dividend is declared.

(iii) Assuming that the company pays the dividend and has net profits of Rs. 5,00,000 and makes new investments of Rs. 10,00,000 during the period, how many new shares must be issued? Use the MM Model. **(C.A Final Nov. 1990)**

Solution

As per MM Model, the current MP of the share is

$$P_o = \frac{D_1 + P_1}{1 + W_e}$$

(i) If the dividend is not declared

$$100 = \frac{0 + P_1}{(1 + .1Z)}$$

$$100 = \frac{P_1}{1.1Z}$$

$$P_1 = \text{Rs. } 112$$

(ii) If the dividend is declared

$$100 = \frac{10 + P_1}{1 + 0.1Z}$$

$$100 = \frac{10 + P_1}{1.1Z}$$

$$112 = 10 + P_1$$

$$P_1 = 112 - 10$$

$$P_1 = \text{Rs. } 102$$

(iii) In case the firm which pays dividend of Rs. 10 per share, then the number of new shares to be issued is M.

$$M \times P_1 = I - (X - nD_1)$$

$$M \times 102 = 10,00,000 - (5,00,000 - 10,000 \times 10)$$

$$102\ m = 10,00,000 - 4,00,000$$

$$M = \frac{6,00,000}{10Z}$$

$$= 5882.35 \text{ (or) } 5883$$

The firm should issue 5883 new shares @ Rs. 102 per share to finance its investment proposals.

Exercise 4

Z Ltd., has risk allying firm for which capitalization rate is 12%. It currently has outstanding 8,000 shares selling at Rs. 100 each. The dividend for the current financial year is Rs. 7 per share. The company expects to have a net income of Rs. 69,000 and has a proposal formatting new investments of Rs. 1,60,000. Show that under the MM hypothesis the payment of dividend does not affect the value of the firm.

(a) Value of the firm when dividends are paid. Price of the shares at the end of the current financial year.

$$P_1 = P_o (1+K_e) - D1$$

$$= 100 (1 + .12) - 7$$

$$= 100 \times 1.12 - 7$$

$$P_1 = \text{Rs. } 105$$

(b) Number of shares to be issued.

$$S = \frac{I - (TE - nD)}{P_1}$$

$$= \frac{1,60,000 - (66000 - (8000 \times f))}{105}$$

$$= \frac{1,60,000 - (13000)}{105}$$

$$\frac{1,4f,000}{105} = 1400 \text{ shares}$$

The MM hypothesis explained in another firm also assumes that investment required by the firm on account of payment of dividends is finance out of the new issue of equity shares.

$$S = \frac{I - (TE - nD)}{W_1}$$

S = Value of the firm can be calculated as follows.

$$nP_o = \frac{(k + S)\, W_1 - (1 - TE)}{1 + W_e}$$

nP_o = Value of the firm

TE = Total Earnings

M_1 = Market Price at the end of the period

K_e = Cost of capital

D = Dividend paid at the end of the year (or) period

N = Number of shares outstanding at the beginning of the period.

$$nP_o = \frac{(k + S)\, W_1 - (1 - TE)}{1 + W_e}$$

$$= \frac{8000 + 1400 \times 105 - (1,60,000 - 66,000)}{1+1Z\%}$$

$$= \frac{6400 \times 105 - 61000}{1.1Z}$$

$$= 8,00,000$$

Criticism of MM approach

MM approach consists of certain criticisms also. The following are the major criticisms of MM approach.

MM approach assumes that tax does not exist. It is not applicable in the practical life of the firm.

MM approach assumes that, there is no risk and uncertain of the investment. It is also not applicable in present day business life.

MM approach does not consider floatation cost and transaction cost. It leads to affect the value of the firm.

MM approach considers only single decrement rate, it does not exist in real practice.

MM approach assumes that, investor behaves rationally. But we cannot give assurance that all the investors will behave rationally.

RELEVANCE OF DIVIDEND

According to this concept, dividend policy is considered to affect the value of the firm. Dividend relevance implies that shareholders prefer current dividend and there is no direct relationship between dividend policy and value of the firm. Relevance of dividend concept is supported by two eminent persons like Walter and Gordon.

Walter's Model

Prof. James E. Walter argues that the dividend policy almost always affects the value of the firm.

Walter model is based in the relationship between the following important factors:

- Rate of return I
- Cost of capital (k)

According to the Walter's model, if $r > k$, the firm is able to earn more than what the shareholders could by reinvesting, if the earnings are paid to them. The implication of $r > k$ is that the shareholders can earn a higher return by investing elsewhere.

If the firm has $r = k$, it is a matter of indifferent whether earnings are retained or distributed.

Assumptions

Walters model is based on the following important assumptions:

1. The firm uses only internal finance.
2. The firm does not use debt or equity finance.
3. The firm has constant return and cost of capital.
4. The firm has 100 recent payout.
5. The firm has constant EPS and dividend.
6. The firm has a very long life.

Walter has evolved a mathematical formula for determining the value of market share.

$$P = \frac{D + \frac{r}{W_e}(E - D)}{W_e}$$

Where,

P = Market price of an equity share

D = Dividend per share

r = Internal rate of return

E = Earning per share

K_e = Cost of equity capital

Exercise 5

From the following information supplied to you, ascertain whether the firm is following an optional dividend policy as per Walter's Model?

Total Earnings	Rs. 2,00,000
No. of equity shares (of Rs. 100 each 20,000)	
Dividend paid	Rs. 1,00,000
P/E Ratio	10
Return Investment	15%

The firm is expected to maintain its rate on return on fresh investments. Also find out what should be the E/P ratio at which the dividend policy will have no effect on the value of the share? Will your decision change if the P/E ratio is 7.25 and interest of 10%?

Solution

$$EPS = \frac{\text{Earnings}}{\text{ko. of Skares}} = \frac{Z00000}{Z0000} = \text{Rs. } 10$$

$$\text{P/E Ratio} = 10$$

$$K_e = \frac{1}{\text{P/E Ratio}} \quad \frac{1}{10} = 0.10$$

$$DPS = \frac{\text{Total Dividends paid}}{\text{ko. of Skares}}$$

$$= \frac{100000}{Z0000} = \text{Rs. } 5$$

The value of the share as per Walter's Model is

$$P = \frac{D+r/ke(E - D)}{W_e}$$

$$= \frac{5+.15/.10\ (10 - 5)}{0.10}$$

$$= \frac{5 + \text{f}.5}{0.10}$$

$$= \text{Rs. } 12.5$$

$$\text{Dividend Payout} = \frac{\text{DPS}}{\text{EPS}} \times 100$$

$$= \frac{5}{10} \times 100 = 60\%$$

r >K_e therefore by distributing 60% of earnings, the firm is not following an optional dividend policy. In this case, the optional dividend policy for the firm would be to pay zero dividend and the Market Price would be:

$$P = \frac{5+.15/.10\ (10-0)}{.10}$$

$$= \frac{5 + 15}{.10}$$

$$= \frac{Z0}{.10}$$

$$P = \text{Rs. } 200$$

So, the MP of the share can be increased by following a zero payout, of the P/E is 7.25 instead of 10 then the K_e =1=0.138 and in this case K_e>r and the MP of the share is 7.25.

$$P = \frac{5 + \frac{.15}{.138}\ (10-5)}{.138}\ .138$$

$$= 5 + 5.435$$

$$\boxed{P = \text{Rs. } \text{f}5.6Z}$$

Exercise 6

The earnings per share of a company are Rs. 80 and the rate of capitalization applicable to the company is 12%. The company has before it an option of adopting a payment ratio of 25% (or) 50%(or) 75%. Using Walter's formula of dividend payout, compute the market value of the company's share of the productivity of retained earnings (i) 12% (ii) 8% (iii) 5%.

Solution

$$E = 10 \text{ and } K_e = 12\% = 0.12$$

As per Walter's Model, the market price of a share is

$$P = \frac{D + \frac{r}{W_e}(E - D)}{W_e}$$

(A) If payout ratio is 25%

(i) r=12%=0.12, D=25%of 10=Rs. 2.50

$$P = \frac{Z.5 + \frac{.1Z}{.1Z}(10 - Z.50)}{.1Z}$$

$$= \frac{Z.50 + f.50}{0.1Z}$$

$$= \frac{10}{0.1Z}$$

$$= \text{Rs. } 83.33$$

$$R = 8\% = 0.08$$

$$R = 8\% = 0.08, D = 25\% \text{ of } 10 = \text{Rs. } 2.50$$

$$Z.50 + \frac{0.08}{0.1Z}(10 - Z.50)$$

$$= \frac{\square 0.1Z}{0.1Z}$$

$$= \frac{Z.50 + 5}{0.1Z}$$

$$= \frac{f.50}{0.1Z} = \text{Rs. } 62.5$$

Exercise 7

From the following data, calculate the MP of a share of ABC Ltd., under (i) Walter's formula; and (ii) Dividend growth model.

EPS = Rs. 10 DPS = Rs. 6

K_e = 18% r = 25%

retention ratio (b) = 45%

Solution:

(i) Walter's Model

$$P = \frac{D + r\,(EPS - DPS)}{W_e}$$

$$= \frac{6 + .Z5\,(10-6)}{.18}$$

$$= \frac{6 + 5.56}{.18}$$

$$= \frac{11.56}{.18}$$

$$= \text{Rs. } 64.22$$

(ii) Dividend Growth Model

$$P = \frac{E(1-b)}{W - br}$$

$$= \frac{10(1-.45)}{.18 - (.45 \times .Z5)}$$

$$= \frac{10 \times .55}{.18 - 0.11Z5}$$

$$= \frac{5.5}{0.06f5}$$

$$= \text{Rs. } 81.48$$

Criticism of Walter's Model

The following are some of the important criticisms against Walter model:

Walter model assumes that there is no extracted finance used by the firm. It is not practically applicable.

There is no possibility of constant return. Return may increase or decrease, depending upon the business situation. Hence, it is applicable.

According to Walter model, it is based on constant cost of capital. But it is not applicable in the real life of the business.

Gordon's Model

Myron Gorden suggest one of the popular model which assume that dividend policy of a firm affects its value, and it is based on the following important assumptions:

1. The firm is an all equity firm.
2. The firm has no external finance.
3. Cost of capital and return are constant.
4. The firm has perpectual life.
5. There are no taxes.
6. Constant relation ratio (g=br).
7. Cost of capital is greater than growth rate (K_e>br).

Gordon's model can be proved with the help of the following formula:

$$P = \frac{E(1 - b)}{W_e - br}$$

Where,

P = Price of a share

E = Earnings per share

1 – b = D/p ratio (i.e., percentage of earnings distributed as dividends)

K_e = Capitalization rate

br = Growth rate = rate of return on investment of an all equity firm.

Exercise 8

Raja company earns a rate of 12% on its total investment of Rs. 6,00,000 in assets. It has 6,00,000 outstanding common shares at Rs. 10 per share. Discount rate of the firm is 10% and it has a policy of retaining 40% of the earnings. Determine the price of its share using Gordon's Model. What shall happen to the price of the share if the company has payout of 60% (or) 20%?

Solution

According to Gordon's Model, the price of a share is

$$P = \frac{E\ (1 - b)}{W_e - br}$$

Given: E = 12% of Rs. 10=Rs. 1.20

r = 12%=0.12

K =10%=0.10

t = 10%=0.10

b = 40%=0.40

Put the values in formula

$$P = \frac{1.Z0\ (1 - .40)}{10 - (.40 \times .1Z)}$$

$$= \frac{1.Z0 \times (0.60)}{.10 - 0.048}$$

$$= \frac{0.fZ}{0.05Z}$$

= Rs. 13.85

If the firm follows a policy of 60% payout then b=20% =0.20

The price is $$P = \frac{1.Z0\ (1\times0.Z0)}{.10 - (.Z\times.1Z)}$$

$$= 0.05$$

r=4% =0.04, D =25% of 10=2.50

$$=Z.50+\frac{\frac{0.04}{0.1Z}(10 - Z.50)}{Z}$$

$$= \frac{5}{0.1Z} = \text{Rs. } 41.67$$

If payout ratio is 50%, D=50% of 10=Rs. 5

r=12%=0.12, D=50% of 10 = Rs. 5

$$= 5+\frac{\frac{0.1Z}{0.1Z}(10 - 5)}{0.1Z}$$

$$= \frac{5+5}{0.1Z}$$

$$= \frac{10}{0.1Z} = \text{Rs. } 83.33$$

r = 8% = 0.08, D = 50% of 10 = 5

$$= \frac{5+\frac{0.8}{0.1Z}(10-5)}{0.1Z}$$

$$= \frac{5+3.33}{0.1Z}$$

$$= \frac{8.33}{0.1Z} = \text{Rs. } 69.42$$

r = 4% = 0.04, D = 50% of 10 = 5

$$= 5+\frac{0.04}{0.1Z}(10 - 5)$$

$$= \frac{5+1.6f}{0.1Z}$$

$$= \frac{6.6f}{0.1Z} = \text{Rs. } 55.58$$

C. If payout ratio is 75%

$$D = 75\% \text{ of } 10 = 7.50$$

(i) $r = 12\% = 0.12, \quad D = 75\% \text{ of } 10 = 7.50$

$$P = \frac{\frac{f.5O+0.08}{0.1Z}(10 - f.50)}{0.1Z}$$

$$= \frac{f.50+Z.50}{0.1Z} = \text{Rs. } 83.33$$

(ii) $r = 8\% = 0.8, \quad D = 75\% \text{ of } 10 = 7.50$

$$P = \frac{\frac{f.5O+0.08}{0.1Z}(10 - f.50)}{0.1Z}$$

$$= \frac{f.50 + 1.6f}{0.1Z}$$

$$= \frac{6.1f}{0.1Z} = \text{Rs. } f6.4Z$$

(iii) $r = 4\% = 0.04, \quad D = 75\% \text{ of } 10 = 7.50$

$$P = \frac{\frac{f.5O+0.04}{0.1Z}(10 - f.50)}{0.1Z}$$

$$= \frac{f.50 + 0.83}{0.1Z}$$

$$= \frac{8.33}{0.1Z} = \text{Rs.}66.4Z$$

$$= \frac{1.Z0 \times 0.80}{.10 - 0.0Z4}$$

$$= \frac{0.66}{0.0f6} = \text{Rs.}1Z.63$$

If the payout is 20% the value of b=0.60 and the price of the share is

$$= \frac{1.Z0\ (1 - 0.60)}{.10 - (.80 \times .1Z)}$$

$$= \frac{1.Z0 \times 0.40}{.10 - 0.066}$$

$$= \frac{0.48}{0.0004} = \text{Rs. } 120$$

Criticism of Gordon's Model

Gordon's model consists of the following important criticisms:

Gordon model assumes that there is no debt and equity finance used by the firm. It is not applicable to present day business.

K_e and r cannot be constant in the real practice.

According to Gordon's model, there are no tax paid by the firm. It is not practically applicable.

FACTORS DETERMINING DIVIDEND POLICY

Profitable Position of the Firm

Dividend decision depends on the profitable position of the business concern. When the firm earns more profit, they can distribute more dividends to the shareholders.

Uncertainty of Future Income

Future income is a very important factor, which affects the dividend policy. When the shareholder needs regular income, the firm should maintain regular dividend policy.

Legal Constrains

The Companies Act 1956 has put several restrictions regarding payments and declaration of dividends. Similarly, Income Tax Act, 1961 also lays down certain restrictions on payment of dividends.

Liquidity Position

Liquidity position of the firms leads to easy payments of dividend. If the firms have high liquidity, the firms can provide cash dividend otherwise, they have to pay stock dividend.

Sources of Finance

If the firm has finance sources, it will be easy to mobilise large finance. The firm shall not go for retained earnings.

Growth Rate of the Firm

High growth rate implies that the firm can distribute more dividend to its shareholders.

Tax Policy

Tax policy of the government also affects the dividend policy of the firm. When the government gives tax incentives, the company pays more dividend.

Capital Market Conditions

Due to the capital market conditions, dividend policy may be affected. If the capital market is prefect, it leads to improve the higher dividend.

TYPES OF DIVIDEND POLICY

Dividend policy depends upon the nature of the firm, type of shareholder and profitable position. On the basis of the dividend declaration by the firm, the dividend policy may be classified under the following types:

- Regular dividend policy
- Stable dividend policy
- Irregular dividend policy
- No dividend policy.

Regular Dividend Policy

Dividend payable at the usual rate is called as regular dividend policy. This type of policy is suitable to the small investors, retired persons and others.

Stable Dividend Policy

Stable dividend policy means payment of certain minimum amount of dividend regularly. This dividend policy consists of the following three important forms:

Constant dividend per share

Constant payout ratio

Stable rupee dividend plus extra dividend.

Irregular Dividend Policy

When the companies are facing constraints of earnings and unsuccessful business operation, they may follow irregular dividend policy. It is one of the temporary arrangements to meet the financial problems. These types are having adequate profit. For others no dividend is distributed.

No Dividend Policy

Sometimes the company may follow no dividend policy because of its unfavourable working capital position of the amount required for future growth of the concerns.

MODEL QUESTIONS

1. What is dividend? Explain the types of dividend.
2. Explain the approaches of dividend decision.
3. Explain the factors affecting the dividend policy.
4. Discuss the various types of dividend policy.
5. Explain the irrelevance and relevance dividend theories.
6. State the criticism of MM approach.
7. What are the assumptions of Walter's model?

_____ analysis is a technique used to assess the returns associated with various cost structures and levels of sales.	Marginal
Earnings before interest and taxes (EBIT) is a descriptive label for	gross profits.
_____ costs are a function of time, not sales, and are typically contractual.	Fixed
_____ costs are a function of volume, not time.	Fixed operating
The firm's _____ is the level of sales necessary to cover all operating costs, i.e., the point at which EBIT = $0.	total breakeven point
Which of the following is NOT a variable cost?	Rent.
_____ costs require the payment of a specified amount in each accounting period.	Variable
At the operating breakeven point, _____ equals zero.	sales revenue
A firm's operating breakeven point is sensitive to all of the following variables EXCEPT	sales price per unit.
If a firm's fixed operating costs decrease, the firm's operating breakeven point will	remain unchanged.
If a firm's variable costs per unit increase, the firm's operating breakeven point will	increase.
If a firm's sale price per unit decreases, the firm's operating breakeven point will	decrease.
If a firm's fixed financial costs decrease, the firm's operating breakeven point will	remain unchanged.
The firm's operating breakeven point is the point at which	total operating costs equal total fixed costs.
Noncash charges such as depreciation and amortization _____ the firm's breakeven point.	do not affect
The per dollar contribution toward fixed operating costs and profits provided by each dollar of sales is the	contribution margin.
One function of breakeven analysis is to	create profits.
The preferred approach to breakeven analysis for the multiproduct firm is the	overall breakeven point.
The long-term funds of the firm are called	equity.
_____ results from the use of fixed-cost assets or funds to magnify returns to the firm's owners.	Capital structure
_____ leverage is concerned with the relationship between sales revenues and earnings before interest and taxes.	Variable
_____ is the risk to the firm of being unable to cover operating costs.	Diversifiable risk
_____ is the risk to the firm of being unable to cover financial obligations.	Business risk
_____ leverage is concerned with the relationship between sales revenue and earnings per share.	Operating

_____ leverage is concerned with the relationship between earnings before interest and taxes and earnings per share.	Operating
_____ is the potential use of fixed operating costs to magnify the effects of changes in sales on earnings before interest and taxes.	Ratio analysis
_____ is the potential use of fixed financial charges to magnify the effects of changes in earnings before interest and taxes on the firm's earnings per share.	Financial leverage
Fixed financial charges include	stock repurchase expense.
A decrease in fixed financial costs will result in _____ in financial risk.	no change
The three basic types of leverage are	Operating, production, and total.
Higher financial leverage causes _____ to increase more for a given increase in _____.	EPS; EBIT
_____ is the potential use of fixed costs, both operating and financial, to magnify the effect of changes in sales on the firm's earnings per share.	Financial leverage
As fixed operating costs increase and all other factors are held constant, the degree of operating leverage will	increase.
Through the effects of financial leverage, when EBIT increases, earnings per share will	remain unchanged.
With the existence of fixed operating costs, a decrease in sales will result in _____ in EBIT.	a proportional increase
An increase in fixed operating costs will result in _____ in the degree of operating leverage.	no change
A firm has fixed operating costs of $175,000, total sales revenue of $3,000,000 and total variable costs of $2,250,000. The firm's degree of operating leverage is _____.	0.81
A firm has EBIT of $375,000, interest expense of $75,000, preferred dividends of $6,000 and a tax rate of 40 percent. The firm's degree of financial leverage at a base EBIT level of $375,000 is _____.	0.97
A decrease in fixed operating costs will result in _____ in the degree of financial leverage.	an undetermined change
Generally, _____ in leverage result in _____ return and _____ risk.	increases; decreased; decreased
Because the degree of total leverage is multiplicative and not additive, when a firm has very high operating leverage it can moderate its total risk by	using a lower level of financial leverage.
Financial leverage measures the effect of fixed financing costs on the relationship between	EBIT and EPS.

Total leverage measures the effect of fixed costs on the relationship between	EBIT and EPS.
The _____ approach to capital structure proposes that an optimal capital structure be selected which _____.	M and M; maximizes the weighted average cost of capital
The basic shortcoming of the EBIT-EPS approach to capital structure is	that it concentrates on the maximization of EPS rather than the maximization of owner's wealth.
The payment of cash dividends to corporate stockholders is decided by the	SEC.
dividend reinvestment plan _____ on the security.	decreases the return
The information content of dividends refers to	nonpayment of dividends by corporations.
The residual theory of dividends suggests that dividends are _____ to the value of the firm.	residual
Shareholder wealth considerations in the payment of dividends include all of the following EXCEPT	the tax status of the firm's owners.
According to the residual theory of dividends, if the firm's equity need exceeds the amount of retained earnings, the firm would	not need to consider its dividend policy.
According to the residual theory of dividends, if the firm's equity need is less than the amount of retained earnings, the firm would	borrow to pay the cash dividend.
Dividend policy is a form of	capital budgeting policy.
Modigliani and Miller suggest that the value of the firm is not affected by the firm's dividend policy, due to	the optimal capital structure.
Modigliani and Miller argue that when the firm has no acceptable investment opportunities, it should	retain the funds until an acceptable project arises.
The dividend policy must be formulated considering two basic objectives, namely	maximizing shareholder wealth and providing for sufficient financing.
The most commonly used dividend policies are all of the following EXCEPT	the variable dividend policy.
The problem with the regular dividend policy from the firm's perspective is that	it bores the shareholders.
The advantage of using the low-regular-and-extra dividend policy is that	the extra dividend may become a regular event.
The great advantage of a _____ is that this policy avoids giving shareholders false hopes.	regular dividend policy

Time-series	Ratio
operating profits.	earnings per share.
Variable	Operating
Semi-variable	Fixed financial
operating breakeven point	cash breakeven point
Materials used.	Delivery costs.
Operating	Fixed
earnings before interest and taxes	fixed operating costs
fixed operating costs.	interest expense.
change in an undetermined direction.	increase.
remain unchanged.	change in an undetermined direction.
change in an undetermined direction.	remain unchanged.
decrease.	increase.
EBIT is less than sales.	total operating costs are zero.
understate	decrease
profit margin.	fixed coverage ratio.
determine the amount of financing needed by the firm.	evaluate the profitability of various sales levels.
breakeven point expressed in dollars.	cash breakeven point.
debt.	capital.
Equity	Leverage
Total	Financial
Financial risk	Total risk
Financial risk	Total risk
Financial	Total

Total	Financial
Operating leverage	Financial leverage
Debt service	Total leverage
common stock dividends and preferred stock dividends.	common stock dividends and bond interest expense.
a decrease	An undetermined change
operating, production, and financial.	operating, financial, and total.
EBIT; sales	EPS; sales
Operating leverage	Total leverage
change in an undetermined direction.	decrease.
change in an undetermined direction.	decrease.
a less than proportional decrease	a more than proportional decrease
an undetermined change	a decrease
0.77	4.29
1.29	1.09
an increase	no change
increases; increased; increased	increases; decreased; increased
increasing EBIT.	using more financial leverage.
Sales and EPS.	Sales and EBIT.

sales and EBIT.	sales and EPS.
EBIT-EPS; maximizes the EPS	traditional; minimizes the cost of debt
that the optimal capital structure is difficult to compute.	its disregard for the firm's dividend policy.
stockholders.	management.
increases the return	has an undetermined effect
a stable and continuous dividend.	dividend changes as indicators of a firm's future.
irrelevant	relevant
the criminal status of the firm's owners.	the potential dilution of ownership on behalf of the firm's owners.
pay no cash dividends.	sell additional stock to pay the cash dividend.
declare a dividend equal to the remaining balance.	not need to consider its dividend policy.
working capital policy.	financing policy.
the relevance of dividends.	the clientele effect.
distribute the unneeded funds to the owners.	lose its doors.
maximizing shareholder wealth and delaying the tax liability of the stockholder.	maintaining liquidity and minimizing the weighted average cost of capital.
the low-regular-and-extra dividend policy.	the regular dividend policy.
it increases the shareholders' uncertainty.	even when earnings are low, the company must pay a fixed dividend.
the firm avoids giving the shareholders false hopes.	if the firm's earnings drop, so does the dividend payment.
low-regular-and-extra dividend policy	constant-payout-ratio policy

Breakeven	**Breakeven**
net profits before taxes.	**operating profits.**
Semi-variable	**Fixed**
Variable	**Variable**
financial breakeven point	**operating breakeven point**
Direct labor.	**Rent.**
Semi-variable	**Fixed**
variable operating costs	**earnings before interest and taxes**
variable operating cost per unit.	**interest expense.**
decrease.	**decrease.**
decrease.	**increase.**
increase.	**increase.**
change in an undetermined direction.	**remain unchanged.**
EBIT is zero.	**EBIT is zero.**
overstate	**overstate**
expense ratio.	**contribution margin.**
describe leverage.	**evaluate the profitability of various sales levels.**
breakeven point expressed in units.	**breakeven point expressed in dollars.**
Assets.	**capital.**
Long-term debt	**Leverage**
Operating	**Operating**
Business risk	**Business risk**
Diversifiable risk	**Financial risk**
Variable	**Total**

Variable	**Financial**
Total leverage	**Operating leverage**
Operating leverage	**Financial leverage**
bond interest expense and preferred stock dividends.	**bond interest expense and preferred stock dividends.**
an increase	**a decrease**
production, financial, and total.	**operating, financial, and total.**
EBIT; EPS	**EPS; EBIT**
Debt service	**Total leverage**
remain unchanged.	**increase.**
increase.	**increase.**
an equal increase	**a more than proportional decrease**
an increase	**an increase**
1.3	**1.3**
1.27	**1.29**
a decrease	**an undetermined change**
decreases; increased; decreased	**increases; increased; increased**
increasing sales.	**using a lower level of financial leverage.**
None of the above.	**EBIT and EPS.**

none of the above.	**sales and EPS.**
residual theory; minimizes dividends	**EBIT-EPS; maximizes the EPS**
its disregard for the presence of preferred stock in the capital structure.	**that it concentrates on the maximization of EPS rather than the maximization of owner's wealth.**
board of directors.	**board of directors.**
has no effect on the return	**increases the return**
a dividend paid as a percent of current earnings.	**dividend changes as indicators of a firm's future.**
integral	**irrelevant**
the investment opportunities of the firm's owners.	**the criminal status of the firm's owners.**
borrow to pay the cash dividend.	**pay no cash dividends.**
pay no cash dividends.	**declare a dividend equal to the remaining balance.**
dividend reinvestment policy.	**financing policy.**
the informational content.	**the clientele effect.**
lower its cost of capital.	**distribute the unneeded funds to the owners.**
delaying the tax liability of the stockholder and information content.	**maximizing shareholder wealth and providing for sufficient financing.**
the constant-payout-ratio policy.	**the variable dividend policy.**
if the firm's earnings drop, so does the dividend payment.	**even when earnings are low, the company must pay a fixed dividend.**
cyclical shifts in earnings may be avoided.	**the firm avoids giving the shareholders false hopes.**
none of the above	**low-regular-and-extra dividend policy**

UNIT – V

WORKING CAPITAL MANAGEMENT

SYLLABUS

UNIT V Working capital Management

Working capital requirements: Meaning - concept – kinds – importance of adequate working capital - determinants of working capital - working capital policy- estimation of working capital – operating cycle/ cash conversion cycle. Cash management: optimal cash, cash budget. Inventory management: EOQ, Reorder level Receivables Management: Credit policy, receivables matrix.

Meaning of Working Capital: Capital required for the business can be of two types:

1. Fixed Capital
2. Working Capital

Fixed capital is required to create the production facilities through purchase of fixed assets like Land, Machinery, and Building etc. Investment in these assets represents that part of firm‟s capital, which is blocked on permanent or fixed basis and is called fixed capital. Funds are also needed for short-term purpose for the purchase of Raw material, Payment of Wages etc. these funds are known as Working Capital. In simple words, working capital refers to that part of firm‟s capital, which is required for financing short-term assets.

Definitions of Working Capital: According to Shubin: “Working Capital is the amount of funds necessary to cover the cost of operating the enterprises.” According to Genestenberg: “ Working Capital means current assets of a comp-any that are changed in the ordinary course of business from one form to another as for e.g. Cash to inventories, inventories to receivables and receivables to cash”.

KINDS OF WORKING CAPITAL

ON THE BASIS OF

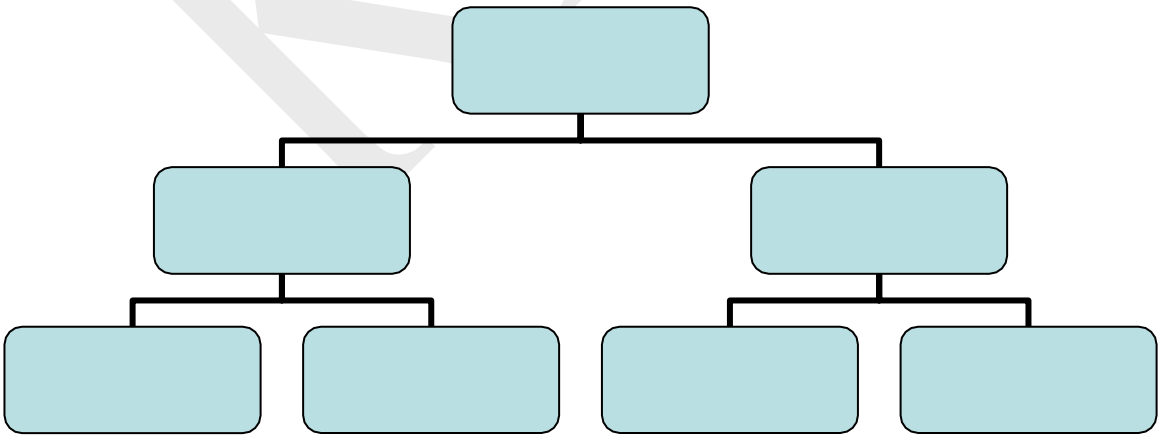
GROSS WORKING CAPITAL

NET WORKING CAPITAL

ON THE BASIS OF

PERMANENT OR FIXED WORKING CAPITAL

TEMPORY AND VARIABLE WORKING



(A) On the basis of concept

(i) Gross working capital concept: According to this concept, working capital means total of all current assets of business..

Gross working capital = Total current assets.

(ii) Net working capital concept: According to this concept, working capital means excess of current assets over current liabilities.

Net Working capital = Current Assets – current Liabilities

As per the general practice net working capital is referred to simply as working capital.

(B) On the basis of time

(i) Fixed or permanent working capital: There is always a minimum level of current assets which is continuously required by the enterprise to carry out normal business operation. For ex. Every firm has to maintain a minimum level of stock and cash balance. This minimum level of current assets is called fixed working capital as this amount is permanently blocked in currant assets

(ii) Temporary or variable working capital. It is that amount of working capital which is required to meet the seasonal demand and some special needs. Any amount over and above the permanent level of working capital is called as Temporary or variable working capital.

Operating Cycle / Need for Working Capial

Every business needs some amount of working capital. The need for working capital arises due to the time gap between the production and realization of cash from sales. Thus working capital is needed for the following purposes:

1. For the purchase of raw material, components and spares parts.
2. To pay wages and salaries
3. To incur day-to-day expenses.
4. To meet the selling costs s packing, advertising.
5. To provide the credit facilities to the customers.
6. To maintain the inventories of Raw material, work in progress, finished stock

There is an operating cycle involved in the sales and realization of cash. The cycle starts with the purchase of raw material and ends with the realization of cash from sales of finished foods. It involves purchase of raw material and stores, it conversion in to stock of finished goods through

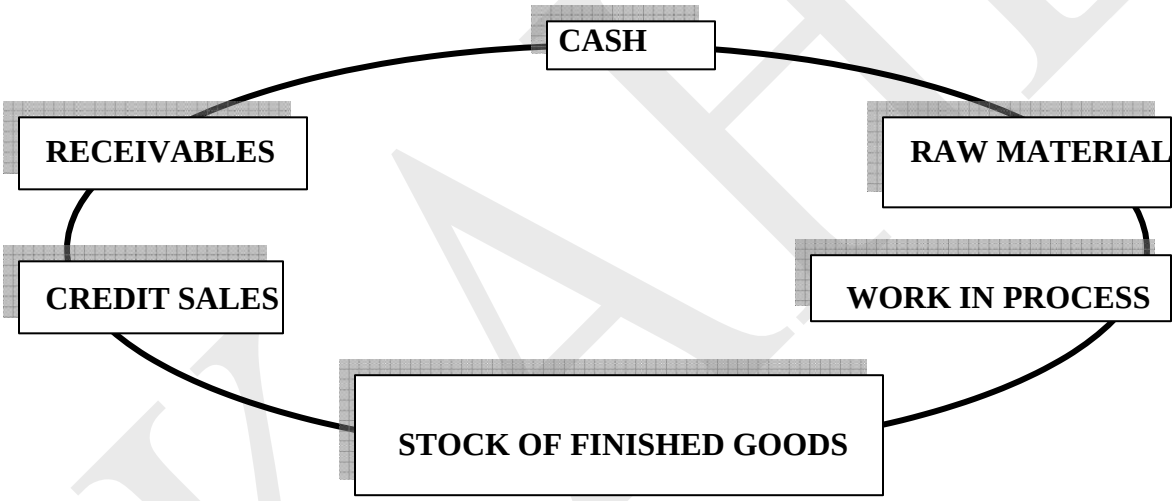
work-in- progress, conversion of finished stock in to sales, debtors and receivables and ultimately in cash and this cycle continues again from cash to purchase of raw material and so on.

The gross operating cycle of the firm = RMCP +WIPCP + FGCP+RCP Where, RMCP = Raw material conversion period

WIPCP = Work in progress conversion period FGCP = Finished goods conversion period RCP = Receivables conversion period

However a firm may acquire some resources of credit and thus defer payments fro certain period. In this case

Net operating cycle period = Gross operating cycle period - Payable deferral period.



Factors Determining Working Capital Requirements

The working capital requirement of a concern depends upon a large number of factors, which are as follow:

1. Nature or Character of Business: Public utility undertakings like Electricity, Water supply and Railways need very limited working capital because they offer cash sales only and supply services not products. On the other hand, Trading and Financial firms require less investment in fixed assets but have to investment large amount in current assets like inventories, receivables etc.

2. Size of Business: Greater the size of business unit, generally larger will be the requirement of working capital. In some case even a smaller concern need more working capital due to high overhead charges, inefficient use of resources etc.

3. Production Policy: The production could be kept either steady by accumulating inventories during slack periods with a view to meet high demand during the peak season or the production could be curtailed during the slack season and increased during peak season. If the policy is to keep the production steady by accumulating inventories it will require higher working capital.

4. Seasonal Variations: In certain industries, raw material; is not available throughout year. They have to buy raw material in bulk during the season to ensure an uninterrupted flow and process them during the entire year. A huge amount is blocked in the form of material inventories during such season, which give rise to more working capital.

5. Working Capital Cycle: In manufacturing concern, the working capital cycle starts with the purchase of raw material and ends with the realization of cash from the sales of finished products. This cycle involves purchase of raw material and starts, its conversion into stock of finished goods through work in progress with progressive increment of labor and service costs, conversion of finished stock into sales, Debtor and receivables and ultimately realization of cash and this cycle continues again from cash to purchase of raw material so on.

6. Rate of Stock Turnover: There is high degree of inverse co relationship between the quantum of working capital and the velocity or speed with which the sales are affected. A firm with having a high rate of stock turnover will need lower amount of working capital as compared to the firm having a low rate of turnover.

7. Credit Policy: A concern that purchases its requirement on credits and sells its products / services on cash require lesser amount of working capital. On the other hand, concern buying its requirement for cash and allow credit to its customers, will need larger amount of working capital as very huge amount of funds are bound to be tied up in debtors or bills receivables.

8. Business Cycle: Business Cycle refers to alternate expansion and contraction in general business activity. In period of boom i.e. when the business is prosperous, there is need for larger amount of working capital due to increase in sales, rise in prices, and expansion of business. On the contrary in the times of depression i.e., when there is down swing of cycle, the business contracts,

sales decline, difficulties are faced in collection from debtors and firms may have a large amount of working capital lying idle.

9. Rate of Growth of Business: For the fast growing concern, larger amount of working capital is required.

Importance or Advantages of Adequate Working Capital

Working capital is the lifeblood and nerve center of a business. No business can run successfully without and adequate amount of working capital. The main advantage of maintaining adequate amount of working capital is as follow:

1. Solvency of the business: Adequate amount of working capital helps in marinating solvency of business by providing uninterrupted flow of production.
2. Goodwill: sufficient amount of working capital enables business concern to make the prompt payment and helps in creating and marinating goodwill.
3. Easy Loans: a concern having adequate amount of working capital, high solvency and credit standing can arranges loans from banks.
4. Cash Discounts: Adequate amount of working capital also enables a concern to avail cash discounts on the purchases and hence it reduces the costs.
5. Exploitation of favorable market condition: Adequate amount of working capital enables a concern to exploit favorable market conditions such as purchasing its requirement in bulk when the prices are lower and by holding its inventories for higher prices.
6. Ability to face the crises: Adequate amount of working capital enables a concern to face the business crises in emergencies such as depression because during such periods, generally there is much pressure on working capital.
7. Quick and regular return on investments: Adequate amount of working capital enables a concern pay quick and regular dividends to its investors as there may not be much pressure to plough back profits.
8. Regular supply of raw material: Adequate amount of working capital ensures regular supply of raw material and continuous production.

Financing of Working Capital

A) Financing of permanent/fixed/or Long term working capital

B) Financing of Temporary, variable or short term working capital

A) Financing of permanent/fixed/or Long term working capital: Permanent working capital should be financed in such a manner that the enterprise may have its uninterrupted use for a sufficient long period. There are five important sources of long term or permanent capital .

1. Shares
2. Debentures / bonds
3. Public deposits
4. Plugging back of profits
5. Loans from financial institutions

These long term sources of finance have already been discussed in detail in the first unit of the book.

B) Financing of Temporary, variable or short term working capital: The main sources of short term working capital are as follows

1) Indigenous Bankers: Private money lenders used to be the only source of finance prior to the establishment of commercial banks. They used to charge very high rates of interest.

2) Trade credit: Trade credit refers to the credit extended by suppliers of goods in the normal course of business. The credit worthiness of a firm and the confidence of its suppliers are the main basis of securing trade credit. The main advantages of trade credit are:

- It is easy and convenient method of finance.
- It is flexible as the credit increases with the growth of firm
- It is informal and spontaneous source of finance.

3) Installment credit: In this assets are purchased and possession of goods is taken immediately but payment is made in installment over a predetermined period. Generally, interest is charged on the unpaid price or it may be adjusted in the price.

4) Advances: Some business houses get advances from their customers and agents against orders. Usually the manufacturing concerns having long production cycle prefer to take advances from their customers.

5) Factoring or Accounts Receivable Credit: A commercial bank may provide finance by discounting bills or invoices of its customers. Thus, a firm gets immediate payment for sale made on

credit. A factor is a financial institution which offers services related to management and financing of debts arising out of credit sales.

6) Accrued expenses: Accrued expenses are the expenses which have been incurred but not yet due and hence not yet paid also. For ex. Wages, salaries, rent, interest, taxes etc.

7) Deferred Incomes: Deferred incomes are incomes received in advance before supplying goods or services. However, firms having great demand for its products and services, and those having good reputation in the market can demand deferred incomes.

8) Commercial Paper: Commercial paper represents unsecured promissory notes issued by firms to raise short-term funds. But only large companies enjoying high credit rating and sound financial health can issue commercial paper to raise short-term funds. The Reserve Bank of India has laid down a number of conditions to determine eligibility of a company for the issue of commercial paper. Only a company which is listed on the. Stock exchange has a net worth of at least Rs. 10 corers and a maximum permissible bank finance of Rs. 25 crores can issue commercial paper not exceeding 30 per cent of its working capital limit. The maturity period of commercial paper mostly ranges from 91 to 180 days. It is sold at a discount from its face value and redeemed at face value on its maturity.

Determining the Working Capital Financing Mix

There are two sources of financing working capital requirements: (i) Long-term sources (ii) short-term sources. Therefore, a question arises as to what portion of working capital (current assets) should be financed by long-term sources and how much by short-term sources? There are three basic approaches for determining an appropriate working capital financing mix.

The Hedging or Matching Approach: The term 'hedging' usually refers to two off-selling transactions of a simultaneous but opposite nature which counterbalance the effect of each other. With reference to financing mix, the term hedging refers to a process of matching maturities of debt with the maturities of financial needs. According to this approach, the maturity of sources of funds should match the nature of assets to be financed. This approach is, therefore, also known as 'matching approach'. This approach classifies the requirements of total working capital into two categories:

(i) Permanent or fixed working capital which is the minimum amount required to carry out the normal business operations. It does not vary over time.

(ii) Temporary or seasonal working capital which is required to meet special exigencies. It fluctuates over time.

The hedging approach suggests that the permanent working capital requirements should be financed with funds from long-term sources while the temporary or seasonal working capital requirements should be financed with short-term funds. The following example explains this approach.

Estimated total investments in Current Assets of Company X for the year 2008

Month	***Investments in Current assets*** *(Rs.)*	***Permanent or Fixed Investment*** *(Rs.)*	***Temporary or Seasonal investment*** *(Rs.)*
January	50,400	45,000	5,400
February	50,000	45,000	5.000
March	48,700	45,000	3,700
April	48,000	45.000	3,000
May	46,000	45,000	1,000
June	45,000	45.000	-
July	47,500	45,000	2,500
August	48,000	45,000	3,000
September	49,500	45,000	4,500
October	50,700	45,000	5,700
November	52,000	45.000	7,000
December	48,500	45.000	3,500
		Total	**44,300**

According to hedging approach the permanent portion of current assets required (Rs. 45,000) should be financed with long-term sources and temporary or seasonal requirements in different months (Rs. 5,400 Rs. 5,000 and so on) should be financed from short-term sources.

The Conservative Approach: This approach suggests that the entire estimated investments in current assets should be financed from long-term sources and the short-term sources should be used only for emergency requirements. According to this approach, the entire estimated requirements of Rs. 52,000 in the month of November (in the above given example) will be financed from long-term sources. The short-term funds will be used only to meet emergencies.

The distinct features of this approach are: (i) Liquidity is severally greater (ii) Risk is minimized

(iii) The cost of financing is relatively more as interest has to be paid even on seasonal requirements for the entire period

Trade off Between the Hedging and Conservative Approaches : The hedging approach implies low cost, high profit and high risk while the conservative approach leads to high cost, low profits and low risk. Both the approaches are the two extremes and neither of them serves' the purpose of efficient working capital management. A trade off between the two will then be an acceptable approach. The level of trade off may differ from case to case depending upon the perception of risk by the persons involved in financial decision-making. However, one way of determining the trade off is by finding the 'average of maximum and the minimum requirements of current assets or working capital. The average requirements so calculated may be financed out of long-term funds and the excess over the average from the short-term funds. Thus, in the above given example the average requirements of Rs. 48.500.

45,000+52,000

. 2

may be financed from long-term while the excess capital required during various months from short-term sources.

The Aggressive Approach: The aggressive approach suggests that the entire estimated requirements of currents asset should be financed from .short-term sources and even a part of fixed' assets investments be financed from short-term sources. This approach makes the finance- mix more risky, less costly and more profitable.

Working Capital Analysis

Working capital is very essential to maintain the smooth running of a business. No business can run successfully without an adequate amount of working capital. The concept of working capital has its own importance in a going concern. A going concern, usually, has a positive balance of working capital, i.e., the excess of current assets over current liabilities, but sometimes the uses of working capital may be more than the sources resulting into a negative value of working capital. This negative balance is generally offset soon by gains in the following periods. A study of changes in the uses and sources of working capital is necessary to evaluate the efficiency with which the working capital is employed in a business. This involves the need of working capital analysis. The analysis of working capital can be conducted through a number of devices, such as:

1. Ratio Analysis
2. Funds Flow Analysis
3. Budgeting

Ratio Analysis: A ratio is a simple arithmetical expression of the relationship of one number to another. The technique of ratio analysis can be employed for measuring short-term 'liquidity or working capital position of a firm. The following ratios may be calculated for this purpose:

i. Current Ratio
ii. Acid Test Ratio
iii. Absolute Liquid Ratio
iv. Receivables Turnover Ratio
v. Payables Turnover Ratio
vi. Working Capital Turnover ratio
vii. Ratio of Current Liabilities to Tangible Net Worth

Funds Flow Analysis: Funds flow analysis is a technical device designated to study the sources from which additional funds were derived and the use to which these sources were put. It is an effective management tool to study changes in the financial position (working capital) of a business enterprise between beginning and ending financial statements dates. The funds flow analysis consists of: (i) preparing schedule of changes in working capital, and (ii) statement of sources and application of funds.

Working Capital Budget: A budget is a financial and/or quantitative expression of business plans and policies to be pursued in the future period of time. Working capital budget, as a part of total budgeting process of a business, is prepared estimating future long-term and short-term working capital needs and the sources to finance them, and then comparing the budgeted figures with the actual performance for calculating variances, if any, so that corrective actions may be taken in the future. The objective of a working capital budget is to ensure availability of funds as and when needed, and to ensure effective utilization of these resources. The successful implementation of working capital budget involves the preparing of separate budgets for various elements of working capital, such as, cash, inventories and receivables, etc.

Estimation of Working Capital Requirements

Factors requiring consideration while estimating working capital

1 Total costs incurred on material, wages and overheads.

2 The length of the time for which materials are to remain in stores before they are issued for production.

3 The length of the production cycle or work in progress.

4 The length of the sales cycle during which finished goods are to be kept waiting for sales.

5 The average period of credit allowed to customers.

6 The amount of cash required to pay day to day expenses of the business.

7 The average amount of cash required to make the payments.

8 The average credit period expected to be allowed by suppliers.

9 Time lag in the payment of wages and other expenses.

Illustration 1: You are required to prepare a statement showing the working capital required to finance the level of activity of 18,000 units per year from the following information:-

Particulars	Rs.
Raw material Per Unit	12
Direct labor Per Unit	3
Overheads per Unit	9
Total cost Per Unit	24
Profit per Unit	6

Selling price Per Unit 30

Additional Information:

1. Raw material is in stock on an average for 2 months.
2. Materials are in process on an average for half-a- month.
3. Finished goods are in stock on an average for two months.
4. Credit allowed by creditors is two months in respect of raw materials supplied.
5. Credit allowed to debtors is three months.
6. Lag in payment of wages is half month. Cash on hand and at bank is expected to be Rs. 7,000.
7. You are informed that all activities are evenly spread out during the year.

Solution:

Estimation of Working Capital:

Current Assets:			Rs.
1. Stock-in-Trade			
a. Raw materials	18,000 x 12 x 2/12	=	36,000
b. Work in progress	18000 x 18 x ½/12	=	13,500
c. Finished goods	18,000 x 24 x 2/12	=	72,000
			1, 21,500
2. Sundry debtors	18,000 x 30 x 3/12	=	1, 35,000
3. Cash on hand and at bank	18,000 x 30 x 3/12	=	7,000
			2, 63,500
Less: Current liabilities:			
4. Sundry creditors	18,000 x 12 x 3/12	=	36,000

5. Wages	18,000 x 3 x ½ / 12	=	2250
Estimated Working Capital Requirement			2, 25,250

Working Notes:

(1) Cost of each unit of Work in process	Rs.
Raw materials	12
Labour(50% of Rs. 3)	1.50
Overhead(50% of Rs. 9)	4.50
Total	18

Illustration 2: Runwall Ltd. had annual sales of 50,000 units at Rs.100per unit. The company works for 50 weeks in the year. Cost details of the Company are as given below:

Particulars	Rs.
Raw material Per Unit	30
Labour Per Unit	10
Overheads per Unit	20
Total cost Per Unit	60
Profit per Unit	40
Selling price Per Unit	100

Additional Information:

1. The Company has the practice of storing raw materials for 4weeks requirements.
2. The wages and other expenses are paid after a lag of 2 weeks.
3. Further the debtors enjoy a credit of 10 weeks and Company gets a credit of 4 weeks from suppliers.
4. The processing time is 2 weeks and finished goods inventory is maintained for 4 weeks.

From the above information prepare a working capital estimate, allowing for a 15% Contingency.

Solution:

Estimation working Capital:

RECEIVABLES MANAGEMENT

Receivables constitute a significant portion of the current assets of a firm. But, for investments in the receivables, a firm has to incur certain costs. There is also a risk of bad debts also. It is therefore very necessary to have a proper control and management of receivables.

Meaning of Receivables: Receivables represents amount owed to the firm as a result of sale of goods or services in the ordinary course of business these are the claims of firm against its customers and form a part of the current assets. Receivables are also known as accounts Receivables; trade Receivables, customer Receivables, etc. the Receivables are carried for the customers. The period of credit and extent of Receivables depend upon the credit policy followed by the firm. The purpose of maintaining or investing in Receivables is to meet competition, and to increase the sale and profits of the business.

Costs of maintaining Receivables

1. Cost of Financing Receivables. When a firm maintains receivables, some of the firm"s resources remain blocked in them because there is a time lag between the credit sale to customer and receipt of cash from them as payment. Whether this additional finances is met from its own resources or from outside, it involves a cost to the firm in terms of interest (if financed from outside) or opportunity costs (if internal resources are used).
2. Administrative costs. When a company maintains receivables, it has to incur additional administrative expenses in the form of salaries to clerks who maintain records of debtors, expenses on investigating the creditworthiness of debtors etc.

3. Collection costs. These are costs, which the firm has to incur for collection of the amount at the appropriate time from he customers.
4. Defaulting cost: When customers make default in payment not only is the collection effort to be increased but the firm may also have to incur losses from bad debts.

Meaning and Objectives of Receivables Management

Receivables management is the process of making decision relating to investment in trade debtors. Certain investment in Receivables is necessary to increase the sales and profits of a firm. But at the same time investment in this asset involves cost consideration also. Further there is always risk of bad debts too. Thus the objective of Receivables management is to take a sound decision as regards investment in debtors. In the word of Bolton, S.E. "The objective of Receivables Management is to promote the sales and profits until that point is reached where the return on investment in further funding of Receivables is less than the cost of funds raised to finance that additional credit".

Dimensions of Receivables Management

Receivables management involves the careful consideration of the following steps:

1. Forming of Credit Policy
2. Executing the Credit Policy
3. Formulating and Executing Collection policy

Forming of Credit Policy: A credit policy is related to decision such as Credit standards, length of credit periods, cash discount and discount period.

1. Credit standards: The volume of sales will be influence by the credit policy of the concern. By liberalizing the credit policy the volume of sales can be increased resulting into increased profits. The increased volume of sales is associated with the certain risks also. It will result in enhanced costs and risk of bad debts and delayed receipts. The increase in number of customers will increase the clerical work of maintaining the additional accounts and collecting of information about the credit worthiness of the customers. On the other hand, extending the credit only to credit worthy customers will save the cists like bad debts losses, collection costs, investigation costs etc. the restriction of credit to such customers only will certainly reduce sales volume, thus resulting n

reduced profits. The credit should be liberalized only to the level where incremental revenue matches the additional costs. This the optimum level of investment in receivables is achieved at a point where there is a trade off between the cists, profitability and liquidity

2. Length of Credit period: Length of Credit period means the period allowed to the customers for making the payment. The customers paying well in time may also be allowed certain cash discounts. There are no bindings on fixing the terms. The length of credit period and quantum of discount allowed determine the magnitude of investment in receivables. A firm may allow liberal credit terms to increase the volume of sales. The

lengthening of this period will mean blocking of more money in receivables, which could have been, invested somewhere else to earn income. There may be an increase in debt collection costs and bad debts losses too. If the earnings from additional sales by Length of Credit period are more than the additional costs then the credit terms should le liberalized. A finance manager should determine the period where additional revenues equates the additional costs and should not extend credit beyond this period as the increases in the cost will be more than the increase in revenue.

3. Cash discount: cash discount is allowed to expedite the collection of receivables. The funds tied up in receivables are released. The concern will be able to use the additional funds received from expedited collection due to cash discount. The discount allowed involves cost. The finance manager should compare the earnings resulting from released funds and the cist of the discount. The discount should be allowed only if its cost is less than the earnings from additional funds. If the funds cannot be profitably employed then discount should not be allowed.

4. Discount period: The collection of receivables is influenced by the period allowed for availing the discount. The additional period allowed for this facility may prompt some more customers to avail discount and make payments. For example, if the firm allowing cash discount for payments within 7 days now extends it to payments within 15 days. There may be more customers availing discount and paying early but there will be those also who were paying earlier within 7 days will now pay in 15 days. It will increase the collection period of the concern.

Executing the Credit Policy. The evaluation of credit applications and finding out the credit worthiness of customers should be undertaken.

1. Collecting the Credit information: The first step in implementing the credit policy will be to gather the information about the customers. The information should be adequate enough so that the proper analysis about the financial position of the customers is possible. The type of the information can be undertaken only up to a certain limit because it will involve cost. The cost incurred on collecting this information and the benefit from reduced bad debts losses will be compared. The credit information will certainly help in improving the quality of receivables but the cost of collecting information should not increase the reduction of bad debt losses. The information may be available from the financial statements of the applicant, credit rating agencies; reports from the banks, firm‟s records etc. a proper analysis of financial statements will be helpful in determining the creditworthiness of customers. Credit rating agencies supply information about various concerns. These agencies regularly collect the information about the business units from various sources and keeps the information up to date. Credit information may be available with the banks also. The banks have their credit departments to analyze the financial position of customers. In case of old customer, businesses own records may help to know their credit worthiness. The frequency of payments, cash discount availed may help to form an opinion about the quality of the credit.

2. Credit analysis: After gathering the required information, the finance manager should analyze it to find out the credit worthiness of potential customers and also to see whether they satisfy the standard of the concern or not. The credit analysis will determine the

degree if risk associated with the account, the capacity of the customers to borrow and his ability and willingness to pay.

3. Credit Decision: The finance manager has to take the decision whether the credit is to be extended and if yes up to which level. He will match the creditworthiness of the customers with the credit standard of the company. If the customer‟s creditworthiness is above the credit standards then there is no problem in taking a decision. In case the customer‟s are below the company‟s standards then they should not be out rightly refused. Therefore they should be offered some alternatives facilities. A customer may be offered to pay on delivery on goods; invoices may be sent through bank and released after collecting dues.

4. Financing Investments in receivables and Factoring: Receivables block a part of working capital. Efforts should be made so that the funds are nit tied up in receivables for longer periods. The finance manager should make the efforts to get the receivable financed so that working capital needs are met in time. The banks allow the raising of loans against security of receivables. Banks supply between 60-80% of the amount of receivables of dependable parties only. Then quality will determine the amount of loan. Beside banks, there may be other agencies, which can buy receivables and pay cash for them known as factoring. The factor will purchase only the accounts acceptable to him. The factoring may be with or without recourse. If it is without recourse then any bad debts loss taken up by the factor but if it is with recourse then bad debts loss will be recovered from the seller. The factor may suggest the customer for whom he will extend this facility.

Formulating and executing Collection Policy. The collection of amount due to the customers is very important. The concern should devise the procedures to be followed when accounts become due after the expiry of credit period. The collection policy termed as strict and lenient. A strict policy of collection will involve more efforts on collection. This policy will enable the early collection of dues and will reduce bad debts losses. The money collects will be used for other purpose and the profits of the concern will go up. A lenient policy increases the debt collection period and more bad debts losses. The collection policy should weigh the various aspects associated with it, the gains and looses of such policy and its effects on the finances of the concerns. The collection policy should also devise the steps to be followed in collecting over due amounts. The steps should be like

a) Personal request through telephone
b) Personal visit to customers
c) Taking help of collecting agencies
d) Taking legal action etc.

INVENTORY MANAGEMENT

Introduction: Every enterprise needs inventory for smooth running of its activities. It serves as a link between production and distribution processes. There is generally a time lag between the recognition

of needed and its fulfillment. The greater the time, higher the requirement of inventory. Thus it is very essential to have proper control and management of inventories.

Meaning of Inventory

The inventory means stock of goods, or a list of goods in manufacturing concern, it may include raw material, work in progress and stores etc. it includes the following things:

1. Raw materials are those basic inputs that are converted into finished product through the manufacturing process. Thus, raw materials inventories are those units, which have been purchased and stored for future production.

2. Work-in-process inventories are semi-manufactured products. They represent products that need more work before they become finished products for sale.

3. Finished goods inventories are those completely manufactured products, which are ready for sale. Stocks of raw materials and work-in-process facilitate production, while stock of finished goods is required for smooth marketing operations.

Thus, inventories serve as a link between the production and consumption of goods. The levels of three kinds of inventories for a firm depend on the nature of its business. A manufacturing firm will have substantially high levels of all three kinds of inventories, while a retail or wholesale firm will have a very high level of finished goods inventories and no raw material and work-in-process inventories. Within manufacturing firms, there will be differences. Large heavy engineering companies produce long production cycle products. therefore, they carry large inventories. On the other hand, inventories of a consumer product company will not be large because of short production cycle and fast turnover. Supplies (or stores and spares) is a fourth type of inventory is also maintained by firms. Supplies include office and plant cleaning

materials like soap, brooms, oil, fuel, light bulbs etc. These materials do not directly enter production, but are necessary for production process. Usually, these supplies are small part of the total inventory and do not involve significant investment. Therefore, a sophisticated system of inventory control may not be maintained for them.

Purpose of Holding Inventories

There are three main purposes for holding the inventories:

1. The Transaction Motive: This facilitates the continuous production and timely execution of sales orders.
2. The Precautionary Motive: This necessitates the holding of inventories for meeting the unpredictable changes in demand and supply of material.
3. The Speculative Motive: This includes keeping inventories for taking the advantage of price fluctuations, saving in reordering costs and quantity discounts.

Inventory Management

The investment in inventory is very high in most of the undertakings engaged in manufacturing, wholesale and retail trade. The amount of investment is sometimes more in inventory than on other assets. In India, a study of 29 major industries has revealed that the average cost of the material is 64 paise and the cost of labor and overhead is 36 paise in a rupee. It is necessary for every management to give proper attention inventory management.

A proper planning of purchasing, handling, storing, and accounting should form a proper inventory management. An efficient system of inventory management will determine:-

1. What to purchase
2. How much to purchase
3. From where to purchase
4. Where to store

The purpose of inventory management is to keep the stocks in such a way that neither there is over stocking nor under stocking. The over stocking will mean a reduction of liquidity and starving for other production processes. On the other hand, under stockings, will result in stoppage of work. The investment in inventory should be left in reasonable limits.

Objectives of Inventory Management

The main objectives of inventory management are operational and financial. The operational objectives mean that the materials and spares should be available in sufficient quantity so that work is not disrupted for want of inventory. The financial objective mean that investment in inventories should not remain idle and minimum working capital should be locked in it. The followi8ng are the objectives of inventory management:

1. To ensure the continuous supply of raw material, spare and finished goods so that the production should not suffer at any time.

2. To avoid both over stocking and under stocking of inventory.

3. To maintain the investment in inventories at the optimum level as required the operational and sales activities.

4. To keep material cost under control so that they contribute in reducing the cist of production and overall costs.

5. To eliminate duplication in ordering stocks. This is possible with the help of centralized purchase.

6. To minimize the losses through pilferages, wastages and damages.

7. To design the proper organization for inventory management.

8. To ensure the perpetual inventory control so that the material shown in the stock ledgers should be actually lying in the stores.

9. To facilitate the furnishing of data for short term and long term planning and control of inventory.

TOOLS AND TECHNIQUES OF INVENTORY MANAGEMNT

Effective inventory management requires an effective control, system for inventories. A proper inventory control not only helps in solving the acute problem of liquidity but also increases the profits and causes substantial reduction in the working capital of the concern. The following are the important tools and techniques in inventory management and control:

1. Determination of stock level
2. Determination of safety stock
3. Determination of economic order quantity
4. A.B.C. analysis
5. V E D analysis
6. Inventory turnover ratio
7. JIT Control system

Determination of stock level: Carrying too much and too little inventories is detrimental to the firm. If the inventory level is too little, the firm will face frequent stock outs involving heavy ordering costs and if the inventory if too high it will be unnecessary tie up of capital. Therefore an efficient inventory management requires that a firm should maintain an optimum level of inventory where inventory costs are minimum. Various stock levels are as follow:

a) Minimum level: This represents the quantity, which must be maintained in hand at all, times. If stocks are less than the minimum level than the work will stop due to shortage of material. Following factors are undertaken while fixing minimum stock level.

b) Lead time: The time taken in processing the order and then executing is known as lead time

c) Rate of consumption: It is the average consumption of material in the factory. Minimum stock Level = Re order level – (Normal consumption x Normal reorder period)

d) Reorder level: Re order level is fixed between minimum and maximum level. Reorder level = Maximum Consumption x Maximum reorder period

e) Maximum Level: It is the quantity of the material beyond which a firm should not exceeds its stocks. If the quantity exceed maximum level limit then it will be overstocking. Maximum Level = Reorder level + reorder quantity – (Minimum Consumption x Minimum reorder period)

f) Average stock level: Average Stock level = Minimum stock level + ½ of reorder quantity

Determination of the safety stock: Safety stock is a buffer to meet some unanticipated increase in usage. The usage of inventory cannot be perfectly forecasted. It fluctuates over a period of time. Two costs are involved in the determination of this stock.

- Opportunity cost of stock out
- Carrying costs

The stock out of Raw Material would cause production disruption. The stock out of finished goods result into the failure of the firm in competition as the form cannot provide proper customer service.

Economic order of quantity: A decision about how much to order has a great gignifi8cance in inventory management. The quantity to be purchased should be neither small nor big. EOQ is the

size of lot to be purchased which is economically viable. This is the quantity of the material, which can be purchased at minimum cost. Cost of managing the inventory is made up of two parts:-

Ordering Costs: This cost includes:

a) Cost of staff posted for ordering of goods
b) Expenses incurred on transportation of goods purchased.
c) Inspection costs of incoming material
d) Cost of stationery, postage, telephone charges.

Carrying costs: These are the costs for holding the inventories. It includes:

a) The cost of capital invested in inventories.
b) Cost of storage
c) Insurance cost

d) Cost of spoilage on handling of materials
e) The loss of material due to deterioration.

The ordering and carrying costs of material being high, an effort should be made to minimize these costs. The quantity to be ordered should be large so that economy may be made in transport cost and discounts may also be earned.

Assumptions of EOQ

a) The supply of goods is satisfactory.
b) The quantity to be purchased by the concern is certain
c) The prices of the goods are stable.

EOQ = Root of 2AS/I

Where , A = Annual consumption in rupees

S = Cost of placing an order

I= Inventory carrying cost of one unit

A-B-C Analysis: The materials divided into a number of categories for adopting a selective approach for material control. Under ABC analysis, the materials are divided into 3 categories viz, a B and C. Past experience has shown that almost 10% of the items contribute to 70% of the value of the consumption and this category is called „a" category. About 20% of the items contribute 20% of the value of the consumption and is known as category „B" materials. Category „C" covers about 70% of the items of the material, which contribute only 10% of the value of the consumption.

Class	No. of items %	Value of the Items %
A	10	
B	20	
C	70	70
	20	
	10	

A B C ANALYSIS helps to concentrate more efforts on category A. since greatest monetary advantage will come by controlling these items. An attention should be paid in estimating the requirements, purchasing, maintaining the safety stocks and properly storing of „A" Category, material. These items are kept under a constant review so that a substantial material cost may be controlled. The control of „C" items may be relaxed and these stocks may be purchased for the

year. A little more attention should be given toward „B" category items and their purchase should be undertaken at quarterly or half yearly intervals.

V E D Analysis: The VED analysis is generally used for spare parts. The requirement and urgency of spares parts is different from that of the material. Spare parts are classified as Vital (V), essential (E),

and Desirable (D). The vital spares are must for running the concern smoothly and these must be stored adequately. The non-availability of spare parts will cause havoc on the concern. The E type of spares is also necessary but their stock may be kept at low figures. The stocking of D type of spares may be avoided at times. If the lead time of these spares is less, then stocking of these spares can be avoided. The classification of spares under these three categories is an important decision. A wrong classification of any spare will create difficulties for production department. The classification should be left to the technical staff because they know the need urgency and use of these spares.

Inventory Turnover Ratio: This ratio is calculated to indicate whether the inventories have been used efficiently or not. The purpose is to ensure the blocking of only required minimum funds in inventory. This ratio is also known as Stock velocity.

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory at cost}}$$

$$\text{Inventory Conversion period} = \frac{\text{Days in Year}}{\text{Inventory Turnover Ratio}}$$

Just In Time (JIT) Inventory Control System : Just in time philosophy, which aims at eliminating waste from every aspect of manufacturing and its related activities, was first developed in Japan. Toyota introduced this technique in 1950's in Japan, how U.S. companies started using this technique in 1980's. The term JIT refers to a management tool that helps produce only the needed quantities at the needed time.

Just in time inventory control system involves the purchase of materials in such a way that delivery of purchased material is assured just before their use or demand. The philosophy of JlT control system implies that the firm should maintain a minimum (zero level) of inventory and rely on suppliers to provide materials just in time to meet the requirements.

Objectives of JIT

1. Minimum (zero) inventory and its associated costs.
2. Elimination of non-value added activities and all wastes.
3. Minimum batch/lot size.
4. Zero breakdowns and continuous flow of production.
5. Ensure timely delivery schedules both inside and outside the firm.
6. Manufacturing the right product at right time. -

Features of JIT

1. It emphasises that firms following traditional inventory control system overestimate ordering cost and underestimate carrying costs associated with holding of inventories.
2. It advocates maintaining good relations with suppliers so as to enable purchases of right quantity of materials at right time.
3. It involves frequent production/order runs because of smaller batch/lot sizes.
4. It requires reduction in set up time as well as processing time.
5. The major focus of JlT approach is to purchase or produce in response to need rather than as per the plans and forecasts.

Advantages of JIT Inventory Control System

1. The right quantities of materials are purchased or produced at the right time.
2. Investment in inventory is reduced.
3. Wastes are eliminated.
4. Carrying or holding cost of inventory is also reduced because of reduced inventory.

Reduction in costs of quality such as inspection, costs of delayed delivery, early delivery, processing documents etc. resulting into overall reduction in cost.

CASH MANAGMENT

Introduction: Cash is the most liquid asset that a business owns. Cash in the business enterprises may be compare s to the blood in the human body, which gives life and strength to the human body and the cash imparts life and strength, profits and solvency to the business organization.

What do you understand by Management of Cash? The modern day business comprises of numerous units spread over vast geographical areas. It is the duty of the finance manager to provide adequate cash to each of the units. For the survival of the business it is absolutely necessary that there should be adequate cash. It is the duty of the finance manager to maintain liquidity at all parts of the organization while managing cash. On the other hand, he has also to ensure there are no funds blocked in idle cash. Idle cash resources entail a great deal of cost in term of interest charges and in terms of opportunities costs. Hence the questions of cost of idle cash must also be kept in mind by the finance manager. A cash management scheme therefore, is a delicate balance between the twin objectives of liquidity and costs.

Why we need for cash: The following are the three basic considerations in determining the amount of cash or liquidity as have been outlined by Lord Keynes:

1. Transaction needs: Cash facilitates the meeting of the day to day expenses and other payments on the debts. Normally, inflows of cash from operation should be sufficient for this purpose. But sometimes this inflow may be temporarily blocked. In such cases, it is only the reserve cash balance that can enable the firm to make its payments in time
2. Speculative needs: Cash may be held in order to take advantage of profitable opportunities that may present themselves and which may be lost for want of ready cash settlement.
3. Precautionary needs: Cash may be held to act as for providing safety against unexpected events. Safety as is typified by the saying that a man

Motives for Holding Cash

The firm with the following motives holds cash:

Transaction Motive

Motives of holding cash Precautionary Motive

Speculative Motive

1. Transaction Motive: Transaction Motive requires a firm to hold cash to conduct its business in the ordinary course. The firm needs cash to make payments for purchases, wages, operating expenses and other payments. The need to hold cash arises because cash receipts and cash payments are not perfectly synchronized. So firm should maintain cash balance to make the required payment. If more cash is need for payments than receipts, it may be raised through bank overdraft. On the other hand if there are more cash receipts than payments, it may be spent on marketable securities.

2. Precautionary Motive: cash is also maintained by the firm to meet the unforeseen expenses at a future date. Their are uncontrollable factors like government policies, competition, natural calamities, labor unrest which have heavy impact on the business operations. In such situations, the firm may require cash to meet additional obligations. hence the firm should hold cash reserves to meet such contingencies. Such cash may be invested in the short term marketable securities which may provide the cash s and when necessary.

3. Speculative Motive: To take the advantage of unexpected opportunities, a firm holds cash for investment in profit making opportunities. Such a motive is purely speculative in nature.For e.g. holding cash to rake advantage of an opportunity to purchase raw material at the reduced price on the payment of immediate cash or delay that purchase of material in anticipation of declining prices. It may like to keep some cash balance to make profits by buying securities at the time when their prices fall on account of tight money conditions.

Cash Management: Cash management deals with the following:

1. Cash Planning
2. Managing Cash flows

3. Determining optimum cash balance

Following are some facets of cash management:

Cash planning: cash planning is a technique to plan and control the use of cash. A projected cash flow statement may be prepared, based on the present business operations and anticipated future activities.

Cash Budget / Cash Forecasts: cash budget is a summary statement of the firm‟s expected cash flows and cash balances over the projected period. This information helps the finance manager to determine the future cash needs of the firm, plan for the financing of these needs and exercise control over the cash and to reach liquidity of the firm. It is a forecast of expected cash intake and outlays.

The short-term forecast can be made with the help of cash floe projections. The finance, manager will make the estimate of likely receipts in the near future and the expected disbursement in that period. The long-term cash forecast are also essential for proper cash planning. Long-term forecast indicates company‟s future financial needs for working capital, capital projects etc. Both short term and long-term forecasts may be made with the help of the following methods:

1. Receipts and disbursement methods
2. Adjusted net income methods

Receipts and Disbursement Methods: In this method the receipts made payments of cash are estimated. The cash receipt may be from cash sales, collection from debtors, and sale of fixed assets. Payment may be made for cash purchases, to creditors for goods, purchases of fixed assets etc. the receipts and disbursement are to be equaled over a short as well as long periods. Any shortfall in receipts will have to be met from banks or other sources. Similarly surpluses cash may be invested in the risk free marketable securities.

Adjusted Net Income Method: This method also known as Sources and Uses approach. This method helps in projecting the company‟s need for cash at some future date and to see whether the company will be able to generate sufficient cash. If not, then it will have to decide about borrowing.

In preparing the adjusted net income forecast, items such as net income. Depreciation, tax, dividends can be easily determined from the company‟s annual operating budget. Difficulty is faced in estimating the working capital changes because they are influenced by factors such as fluctuation in raw material costs, changing demand for the company‟s products, for projecting working capital ratios relating to receivables and inventories may be used.

Safety as is typified by the saying that a man has only three friends an old wife, an old dog and money at bank.

Managing Cash Flows

After estimating the cash flows, efforts should be made to adhere to the estimates of receipts and payment of cash. Cash management will be successful only if cash collections are accelerated and ash disbursement is delayed. The following method of cash management will help:

Prompt payment by customers: In order to accelerate cash inflows, the collections from the customers should be prompt. The customers should be promptly informed about the amount payable and the time by which it should be paid. One method is to avail cash discounts.

Quick conversion of payment into cash: improving the cash collection process can accelerate Cash flows. Once the customer writes a cheque in favor of the concern the collection can be quickened by its earlier collection. There is the time gap between the cheque sent by the customers and the amount collected against it. This is due to may factors:

a) Mailing time

b) Postal float i.e. time taken by the post office for transferring the Cheque from customers to the firm.

c) Bank floats i.e. collection time within the bank. All these are known as Deposit float

An efficient cash management will be possible only if time taken in deposit float vis reduced which can be done only by decentralizing collections.

Decentralized Collections: A big firm operating over wide geographical area can accelerate collections by using the system of decentralized collections. A number of collection centers are opened in different area. To reduce the mailing time.

CASH MANAGEMENT MODELS

Determining Optimum Cash Balance: There are basically two approaches to determine an optimum cash balance

1. Minimizing Cost models
2. Preparing cash Budget

Cash Budget: cash budget is a summary statement of the firm‟s expected cash flows and cash balances over the projected period. This information helps the finance, manager to determine the future cash needs of the firm, plan for the financing of these needs and exercise control over the cash and to reach liquidity of the firm. It is a forecast of expected cash intake and outlays.

The cash budget should be coordinated with the other activities of the business. The functional budgets may be adjusted according to the cash budgets. The available funds should be fruitfully used and the concern should not suffer for the wants of funds,

Cash Management Models: There are two models:

a. William J. Baumol‟s Model

b. Miller and Orr model

William J. Baumol‟s Model: Acc to this model the optimum cash balance is the trade off between the opportunity cost and the transaction cost. The optimum cash balance is reached at a point where the total cost is minimum. The Baumol‟s Model is based on the following assumptions:

a) The cash needs of the firm are known with certainty.

b) The opportunity cast of holding cash is known and it remains constants.

c) The transaction cist of converting securities into cash is known and remains constant.

The Baumol‟s Model can be represented algebraically.

$$C = \sqrt{\frac{2A \times F}{O}}$$

Where, C = optimum balance

A = Annual cash Disbursements F = Fixed cost per transaction

O = opportunity cost of holding cash

Miller and Orr Model: The Miller and Orr Model provides two control limits

a) The upper control limit

b) Lower control limit

When the cash balance touches the upper control limit, marketable securities are purchased to the extent of hz to return back to normal cash balance of z. in the same manner when the cash balance touches the lower control point the firm will sell the marketable securities to the extent of oz to again

to return to the normal cash balance. The spread between the upper and lower cash balance limits can be computed using miller and orr Model as follow:

$$Z = 3\left(\frac{3}{4} \times \frac{\text{Transaction Cost} \times \text{Variance of Cash Flows}}{\text{Interest Rate}}\right)^{\frac{1}{3}}$$

$$\text{Return Point} = \text{Lower Limit} + \frac{Z\ (\text{Spread})}{3}$$

$$\text{Variance of Cash flows} = (\text{Standard deviation})^{2}$$

PAYABLE MANAGEMENT

Account Payables Management refers to the set of policies, procedures, and practices employed by a company with respect to managing its trade credit purchases.

In summary, they consist of seeking trade credit lines, acquiring favorable terms of purchase, and managing the flow and timing of purchases so as to efficiently control the company‟s working capital.

The account payables of a company can be found in the short-term liabilities section of its balance sheet, and they mostly consist of the short-term financings of inventory purchases, accrued expenses, and other critical short-term operations.

WHY COMPANIES FINANCE THEIR PURCHASES

Purchasing inventory, raw materials, and other goods on trade credit allows a company to defer its cash outlays, while accessing resources immediately.

When managed appropriately financing purchases can contribute to effective working capital management.

A company that employs best practices with regards to payables management can reap the benefits of stable operating cycles that provide a stable source of operating cash flows and place it in a good liquidity position with respect to its competitors.

OBTAINING TRADE CREDIT

Companies seeking trade credit must demonstrate that they meet certain criteria with respect to their creditworthiness and financial condition.

This typically entails credit analysis by the supplier.

The financial statements of the company are analyzed, paying particular attention to its working capital, short-term liquidity and short and long-term debt to gauge its ability to meet obligations.

The final product of such analysis is usually some form of a credit risk rating.

PURCHASE AND PAYMENT TERMS

The purchase and credit terms obtained will depend on the company‟s risk assessment above.

Companies that are financial stable can benefit from favorable terms (e.g. lengthy repayment periods).

For example, a company might be offered a sales on credit term of 5/10 net 30 implies a 5% discount on the purchase amount if payment is made within 10 days of billing date.

If the discount is not taken, the full invoiced amount is due in 30 day.

MANAGING PAYMENTS

After entering into purchase agreements with a supplier, the company has the responsibility of fulfilling its payment obligations.

The Accounts Payable department is accountable for this function, and performs tasks such as communicating with suppliers, sending payments and reconciling bank records, as well as updating and performing related accounting entries

Managing payables also include the expense administration with respect to the company‟s own employees.

Expenses such as employee travelling, meals, entertainment, and other costs related to doing business for the company are administered by the payables department and must be managed appropriately.

EVALUATING THE PERFORMANCE OF PAYABLES MANAGEMENT

Accounts payable are one of 3 main components of working capital, along with receivables and inventory.

Understanding how these 3 accounts interact among each other and the resulting effects on working capital levels, cash flow, and the operating cycle can help in managing and evaluating payables management.

An appropriate balance must be struck, whereby the advantage of deferring cash outlays using trade credit is weighted against the risk of excessive short-term credit.

It is therefore important to maintain optimal utilization of credit lines and timing of payments, and create a balance between the need for cash, working capital, and liquidity.

A number of metrics and short-term financial ratios can be used to evaluate the performance payables management.

Payables Turnover Ratio

Management can use this ratio to measure the average number of times a company pays its suppliers in a particular period.

A higher number than the industry average indicates the company pays its suppliers at a faster rate than its competitors, and is generally conducive to short-term liquidity.

Days in Payables Outstanding (DPO)

Measuring the average length of time it takes a company to pay for its short-term purchases in a period, the DPO can be used by management to determine an optimal timing of payments for its payables.

The purpose of managing current assets and current liabilities is to _____.
Net working capital is defined as _____.
Which of the following is TRUE of net working capital?
The conversion of current assets _____.
Current liabilities can be viewed as _____.
Which of the following is TRUE of current assets?
In general, the more net working capital a firm has, _____.
A(n) _____ in current assets increases net working capital, thereby _____ the risk of insolvency.
A decrease in current assets and an increase in current liabilities will _____ net working capital, thereby _____ the risk of insolvency.
When a portion of a firm's fixed assets are financed with current liabilities, _____.
Which of the following is TRUE of the impact of cash flows on net working capital?
In working capital management, risk is measured by the probability that a firm will be _____.
If a firm increases its current assets relative to total assets, _____.
The _____ of a firm is the amount of time required for a company to convert cash invested in its operations to cash received as a result of its operations.
The _____ of a firm is the amount of time that elapses from the point when the firm inputs material and labor into the production process to the point when cash is collected from the sale of the finished product that contains these production inputs.
The _____ is the length of time from the point when raw materials are purchased on account to the point when payment is made to the supplier of the goods.
The _____ is the time period that elapses from the point when a firm sells a finished good on account to the point when the receivable is collected.
The _____ is the time period that elapses from the point when a firm uses the raw materials in manufacturing a finished good to the point when the finished good is sold.

Other factors remaining constant, an increase in the average payment period will result in _____.
One way to improve the cash conversion cycle is to _____.
A firm with highly unpredictable sales revenue would best choose _____ funding strategy to minimize risk.
Certain financing plans are termed conservative when _____.
An increase in the current asset to total asset ratio will result in _____.
Which of the following is TRUE of an aggressive funding strategy of a firm?
A decrease in the current asset to total asset ratio will result in _____.
An increase in the current liabilities to total assets ratio will result in _____.
An decrease in the current liabilities to total assets ratio will result in _____.
A decrease in the production time to manufacture a finished good will result in _____.
The difference between the number of days resources are tied up in the operating cycle and the number of days a firm can use spontaneous financing before payment is made is the _____.
A negative cash conversion cycle _____.
A firm may have a negative cash conversion cycle if it carries _____.
Improvements to cash management include _____.
In an aggressive financing strategy, a firm anticipating a large increase in sales for the coming period should finance the increase in working capital with _____.
In theory, the conservative financing strategy ignores _____.
In economic conditions characterized by a scarcity of short-term funds, a firm would best choose the _____ financing strategy.
A risk of the _____ financing strategy is unpredictable interest expense.
The aggressive financing strategy is a _____ method while the conservative financing strategy is a _____ method.
A firm which uses the aggressive financing strategy plans to purchase a major fixed asset financed with a loan. The most likely consequence of this action is _____.
A firm which uses the aggressive financing strategy plans to purchase raw materials in large quantities to take price discounts. The firm will finance the purchase with a long-term loan. The most likely consequence of this action is _____.
A firm's financing requirements can be separated into _____.

The basic strategies for determining the appropriate financing mix are _____.
If a firm uses an aggressive financing strategy, _____.
For minimizing the cash conversion cycle, a firm should _____.
The basic strategies that should be employed by a business firm in managing cash includes _____.
Which of the following is an example of carrying cost?
The _____ uses no, or very little, safety stock.
The total cost of a firm's inventory is found by summing the _____.
The _____ is an inventory technique that takes into account various operating and financial costs to determine the order quantity for a specific inventory item.
In the ABC system of inventory management, the _____ method or system is appropriate for managing B items.
In the EOQ model, if the size of order increases, the _____.
The economic order quantity (EOQ) is the order quantity which minimizes _____.
When a firm's credit standards are relaxed _____.
_____ is a procedure resulting in a number reflecting an applicant's credit strength, derived as a weighted average of the scores obtained on a variety of key financial and credit characteristics.
The key dimension of credit selection which analyzes an applicant's record of meeting past obligations is _____.
_____ are established to evaluate a customer's creditworthiness and to determine the minimum requirements for extending credit to a customer.
The key dimension of credit selection which analyzes an applicant's ability to repay the requested credit focused on cash flows available is _____.
A credit applicant's _____ reflects its ability to repay the requested credit.
A credit applicant's _____ is his or her financial strength as reflected by his or her debt relative to equity.
A credit applicant's _____ reflects his or her record of meeting past obligations.
As credit standards are tightened, sales are expected to _____ and the investment in accounts receivable is expected to _____.

achieve a balance between profitability and risk that contributes to a firm's value
total assets minus total liabilities
When current assets of a firm exceed its current liabilities,a firm is said to have negative net working capital.
from cash to receivables to inventory provides the cash used to repurchase stock
Funds used to finance the noncurrent assets' portion of a firm
They are more profitable because they add more value to the product than that provided by fixed assets.
the greater its risk
decrease; increasing
increase; increasing
the firm will have negative net working capital
The lower the cash outflows lower is the net working capital.
unable to repay its long-term obligations
it reduces return and reduces risk
cash turnover
average collection period
cash conversion cycle
average age of inventory
cash turnover

a decrease in the average collection period
speed up collections
the conservative
working capital is relatively high
a decrease in profit
Under an aggressive funding strategy, a firm funds its seasonal requirements with short-term debt.
a decrease in risk
a decrease in risk
an increase in risk
an increase in the cash conversion cycle
Operating cycle
indicates that a firm is shortening its average payment period and lengthening its average collection period
high inventory and sells its products on credit
an increase in the credit period allowed to customers
a line of credit
the high risk associated with external financing
aggressive
aggressive
high-profit, high-risk; low-profit, low-risk
a decrease in the current ratio
a decrease in net working capital
seasonal and permanent

current and non-current liabilities
it decreases return and decreases risk
turn over inventory as quickly as possible without stockouts
extending the credit period allowed to customers
transportation cost
materials requirement planning system
order cost and the actual cost of a firm's inventory
JIT system
just-in-time
carrying cost will increase
the carrying costs per unit per period
its costs are expected to increase faster than sales if the standards are not relaxed
The economic order quantity model
capacity
Credit standards
capital
collateral
collateral
control
increase; increase

achieve a balance between short-term and long-term financing of a firm	achieve as high a level of current liabilities as possible
current assets minus current liabilities	total liabilities minus total assets
When current assets of a firm exceed its current liabilities,a firm is said to have positive net working capital.	When current assets of a firm are less than its total assets,a firm is said to have positive net working capital.
from inventory to receivables to marketable securities provides the cash used to buy plant and equipment	from cash to receivables to inventory provides the cash used to pay non-current liabilities
liabilities which represent a firm's long-term financing	debts that mature in a period of one year or less
The time of conversion of current assets to more liquid form is relatively unpredictable.	They are sources of short-term financing for a firm.
the less likely are creditors to lend to the firm	the lower its level of long-term funds
increase; reducing	increase; increasing
decrease; reducing	increase; reducing
the net working capital will decrease	the firm will have positive net working capital
The higher the cash inflows lower is the net working capital.	The more predictable the cash inflows of a firm, the easier is the working capital management.
unable to pay its bills as they come due	unable to earn profits from day-to-day operations
It increases return and reduces risk	it reduces return and increases risk
cash conversion cycle	average collection period
Operating cycle	cash conversion cycle
average payment period	average collection period
average payment period	average collection period
average age of inventory	cash conversion cycle

an increase in the cash conversion cycle	a decrease in the cash conversion cycle
slow down inventory turnover	speed up payments
the trade-off	the aggressive
current assets are relatively low	risk is increased
a decrease in risk	an increase in profit
Under an aggressive funding strategy, a firm funds both its seasonal and its permanent requirements with long-term debt.	Under an aggressive funding strategy, a firm funds it permanent requirements with commercial paper and notes payable.
an increase in profit	a decrease in profit
an increase in risk	an increase in profit
a decrease in risk	a decrease in profit
a decrease in the cash conversion cycle	a decrease in the average age of inventory
average payment period	average age of inventory
means that the average payment period exceeds the operating cycle	indicates that a firm is shortening its average age of inventory and average payment period
very little inventory and sells its products for cash	very little inventory and sells its products on credit
an increase in the average age of inventory	a reduction in the cash turnover
a long-term note from the bank	the sale of a bond issue
all current liabilities	the spontaneous forms of short-term financing
conservative	permanent
conservative	permanent
low-profit, high-risk; high-profit, low-risk	high-profit, low-risk; low-profit, high-risk
a decrease in the risk of insolvency	an increase in long-term debt
an increase in net working capital	an increase in risk of insolvency
current assets and fixed assets	current liabilities and long-term debt

short-term and long-term financing	seasonal and permanent funding
it decreases return and increases risk	it increases return and increases risk
pay off accounts payables as fast as possible to gain credibility	grant longer credit terms to customers to maintain healthy business relations
turning over inventory as quickly as possible, avoiding stockouts	paying accounts payable as early as possible
insurance of goods in transit	insurance cost
just-in-time system	basic economic order quantity system
order cost and the carrying cost of a firm's inventory	carrying cost and the marginal cost of a firm's inventory
EOQ model	LIFO model
materials requirement planning	two-bin
storage cost will decrease	order cost will increase
the total inventory costs	the order cost per order
its sales are expected to decrease with a corresponding increase in costs	its costs are expected to decrease with a corresponding decrease in sales
Credit scoring	CAPM
capital	character
Collection agencies	Lines of credit
conditions	capacity
capacity	capital
capacity	character
condition	capacity
decrease; decrease	increase; decrease

achieve as low a level of current liabilities as possible	**achieve a balance between profitability and risk that contributes to a firm's value**
current liabilities minus current assets	**current assets minus current liabilities**
When current assets of a firm exceed its total assets,the firm is said to have negative net working capital.	**When current assets of a firm exceed its current liabilities,a firm is said to have positive net working capital.**
from inventory to receivables to cash provides the cash used to pay current liabilities	**from inventory to receivables to cash provides the cash used to pay current liabilities**
sources of cash inflows from the operating activities of a firm	**debts that mature in a period of one year or less**
They are used to fund long-term operations and pay long-term expenses.	**The time of conversion of current assets to more liquid form is relatively unpredictable.**
the lower its risk	**the lower its risk**
decrease; reducing	**increase; reducing**
decrease; increasing	**decrease; increasing**
the current ratio will increase	**the net working capital will decrease**
The more predictable the cash inflows of a firm, the more current assets a firm needs.	**The more predictable the cash inflows of a firm, the easier is the working capital management.**
unable to pay annual dividends to stockholders	**unable to pay its bills as they come due**
it increases return and increases risk	**It increases return and reduces risk**
average age of inventory	**cash conversion cycle**
average age of inventory	**Operating cycle**
average age of inventory	**average payment period**
cash conversion cycle	**average collection period**
average collection period	**average age of inventory**

an increase in the average collection period	**a decrease in the cash conversion cycle**
slow down credit approvals	**speed up collections**
a seasonal	**the conservative**
short-term financing is used frequently	**working capital is relatively high**
an increase in risk	**a decrease in risk**
Under an aggressive funding strategy, a firm funds it seasonal requirements with bonds and long-term loans.	**Under an aggressive funding strategy, a firm funds its seasonal requirements with short-term debt.**
an increase in risk	**a decrease in risk**
a decrease in profit	**an increase in risk**
an increase in profit	**a decrease in risk**
an increase in the average age of inventory	**a decrease in the cash conversion cycle**
cash conversion cycle	**cash conversion cycle**
means that the operating cycle exceeds the average inventory period	**means that the average payment period exceeds the operating cycle**
high inventory and sells its products for cash	**very little inventory and sells its products for cash**
a reduction in the cash conversion cycle	**a reduction in the cash conversion cycle**
the sale of common stock	**a line of credit**
all current assets	**all current liabilities**
seasonal	**conservative**
seasonal	**aggressive**
low-profit, low-risk; high-profit, high-risk	**high-profit, high-risk; low-profit, low-risk**
an increase in net working capital	**an increase in long-term debt**
a decrease in the current ratio	**an increase in net working capital**
current liabilities and short-term funds	**seasonal and permanent**

aggressive and conservative funding	**aggressive and conservative funding**
it increases return and decreases risk	**it increases return and increases risk**
increase mail managing, processing, and clearing time when collecting from customers	**turn over inventory as quickly as possible without stockouts**
operating in a fashion that requires maximum cash	**turning over inventory as quickly as possible, avoiding stockouts**
cost of inventory	**insurance cost**
FIFO method	**just-in-time system**
order cost and the marginal cost of a firm's inventory	**order cost and the carrying cost of a firm's inventory**
ABC system	**EOQ model**
basic economic order quantity	**basic economic order quantity**
order cost will remain unchanged	**carrying cost will increase**
order quantity in units	**the total inventory costs**
its profit contribution from sales will be greater than the cost contribution	**its profit contribution from sales will be greater than the cost contribution**
Aging of receivables	**Aging of receivables**
collateral	**character**
Credit limits	**Credit standards**
collateral	**capacity**
character	**capacity**
capital	**capital**
character	**character**
decrease; increase	**decrease; decrease**